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MISSOURI PUBLIC SERVICE COMMISSION

INDUSTRY ANALYSIS DIVISION

ENGINEERING ANALYSIS DEPARTMENT

REBUTTAL TESTIMONY

OF

CLAIRE M. EUBANKS, P.E.

**THE EMPIRE DISTRICT ELECTRIC COMPANY,
d/b/a Liberty**

CASE NO. ER-2024-0261

*Jefferson City, Missouri
August 2025*

**** Denotes Confidential Information ****

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CLAIRE M. EUBANKS, P.E.**

**THE EMPIRE DISTRICT ELECTRIC COMPANY,
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CASE NO. ER-2024-0261

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1 **DISTRIBUTION SYSTEM RELIABILITY**

2 Q. What is reliability?

3 A. Reliability is the ability of the electric system to supply power at all times and
4 withstand sudden disturbances.³

5 Q. How do utilities measure reliability performance of distribution systems?

6 A. Reliability metrics are used to assess the operational performance of the
7 distribution system in terms of reliability. Commission rule 20 CSR 4240-23.010 establishes
8 reliability monitoring and reporting requirements for the investor owned electric utilities.
9 These indices are affected by customer density, tree density, geography, observed weather, and
10 other factors that may be beyond the control of the utilities.⁴

11 Q. Which reliability metrics are the utilities required to report, and what do the
12 indices tell us about system reliability?

13 A. There are four metrics the electric utilities are required to report per Chapter 23
14 of the Commission rules:

- 15 • System Average Interruption Frequency Index (“SAIFI”), which is a gauge
16 for the frequency of interruptions.
- 17 • System Average Interruption Duration Index (“SAIDI”), which is a gauge
18 for the duration of outages.
- 19 • Customer Average Interruption Frequency Index (“CAIFI”), which is a
20 gauge for how frequently impacted customers are experiencing
21 interruptions. CAIFI differs from SAIFI in that the index only includes
22 customers who actually experience interruptions.
- 23 • Customer Average Interruption Duration Index (“CAIDI”), which describes
24 the average time to restore service. This metric only includes customers who
25 actually experience interruptions.

³ Reliability is distinguishable from resiliency. Reliability addresses high-frequency, low-impact events and focuses on preventing failures and ensuring consistent performance. Resiliency addresses low-frequency, high-impact events and focuses on how well a system recovers from failures.

⁴ 20 CSR 4240-23.010(11).

1 Investor-owned utilities are required to perform a worst performing circuit analysis per
2 20 CSR 4240-23.010(6). This analysis identifies the utility's top five percent (5%) worst
3 performing circuits by ranking the SAIFI values computed for each circuit. The annual
4 reporting requirements include reporting on actions taken or planned to improve the worst
5 performing circuits.

6 Q. On pages 17 – 20 of Mr. Westfall's direct testimony he presents certain
7 reliability metrics, does he provide discussion of Empire's operational performance of its
8 distribution system in terms of reliability?

9 A. No.

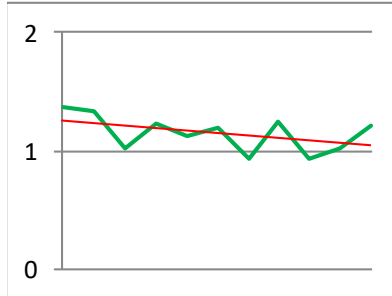
10 Q. What do Empire's reliability metrics indicate to you about its operational
11 performance?

12 A. While SAIFI is on a slight downward trend over the last ten years (meaning there
13 are less frequent outages on the system than in the past), CAIDI and SAIDI are trending toward
14 poorer reliability performance. CAIDI and SAIDI are both related to the duration of outages.
15 The following graphs depict all four metrics based on the data reported by Empire to the
16 Commission in its annual reliability reports covering the period of 2014 through 2024. Note that
17 the reliability metrics presented below exclude major storm event days to focus attention to
18 potential issues that are within the control of the utility.⁵

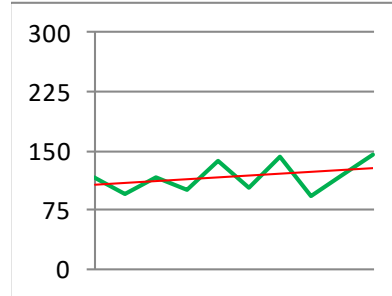
⁵ 20 CSR 4240-23.010(3) requires the reporting of metrics including and excluding major event days.

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SAIFI



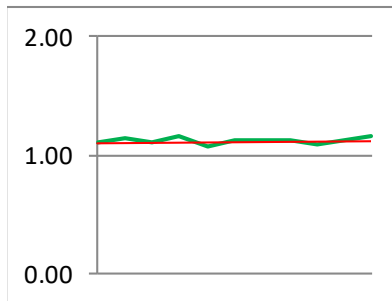
SAIDI



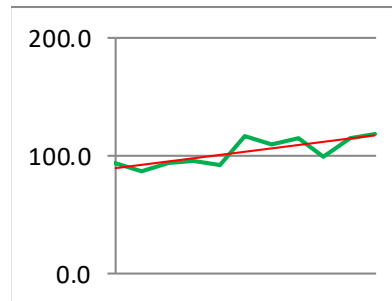
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3

CAIFI



CAIDI



4

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Q. Are there other reliability metrics commonly used in the industry?

6

A. Yes. Other common reliability metrics are MAIFI (Momentary Average Interruption Event Frequency Index), CEMI (Customers Experiencing Multiple Interruptions), and CELID (Customers Experiencing Long Interruption Duration).

9

MAIFI provides an indication of the frequency of momentary outages at the system level. Momentary interruptions are typically considered to be less than five minutes in duration. At the time of Chapter 23 rulemaking in 2008, reporting of MAIFI would have been difficult for some of the electric utilities to meet due to the lack of automated meter readings.

10

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1 Q. Are all customers of Empire experiencing the same level of reliability?

2 A. No. Empire's 2024 Reliability Report indicates there are 14 worst-performing⁶
3 circuits and four multi-year worst-performing circuits on Empire's system.⁷ SAIFI ranged
4 from 2.810 to 6.379 in 2024 for the worst-performing circuits. In other words, on some circuits
5 Empire customers experienced over 2 to 6 interruptions in 2024 compared to the system-wide
6 average 1.2 interruptions in 2024.

7 Q. Were reliability issues discussed during the local public hearings and public
8 comments in this case?

9 A. Although I did not personally attend the local public hearings in this case, it is
10 my understanding from the transcripts that at least six individuals raised concerns with outages.⁸
11 Additionally, one individual raised concerns with service and outages in a public comment.⁹

12 Q. How many informal complaints have been filed over the past five years
13 regarding reliability?

14 A. ** Eight informal complaints regarding Empire, specific to outages, were
15 recorded in EFIS from February 2020 through July 2025, with half of those customers
16 mentioning the duration of the outage as contributing to their complaint. **

17 Q. Can you draw any conclusions based on the reliability data and the concerns
18 raised during the Local Public Hearings and public comments in this case?

⁶ 20 CSR 4240-23.010(6) and 20 CSR 4240-23.010(8).

⁷ EO-2025-0300, 2024 Missouri Annual Reliability Report (Revised), page 8 and page 15.

⁸ Twelve individuals mentioned outages or power being out but not all comments were related to concerns with frequency or duration. Several mentioned inconsistent billing in relation to an outage.

⁹ As of August 11, 2025.

1 A. Empire’s reliability metrics and concerns raised by customers suggest that
 2 Empire should focus attention on reducing the duration of outages and improving the reliability
 3 of its worst-performing circuits.

4 Q. How does distribution system investment compare to Empire’s total capital
 5 investment plan?

6 A. The table below represents Empire’s planned Capital Investment Plan
 7 for 2025-2029.¹⁰

8

2025 Liberty Capital Investment Plan							<i>\$ Millions</i>
Program Name	2025	2026	2027	2028	2029	Total	
Solar	\$11.0	\$10.0	\$99.0	\$225.2	\$0.0	\$345.3	
Plant Emissions	\$1.3	\$1.5	\$1.6	\$1.7	\$1.8	\$8.1	
Transportation Electrification *	\$0.2	\$0.8	\$0.4	\$0.3	\$0.3	\$1.9	
Cyber & Technology Upgrades *	\$15.7	\$13.2	\$13.2	\$13.6	\$13.6	\$69.4	
Grid Resiliency - Distribution *	\$78.2	\$127.7	\$159.3	\$163.1	\$152.2	\$680.5	
Grid Resiliency - Transmission	\$29.2	\$91.1	\$173.5	\$282.9	\$216.9	\$793.6	
Generation Optimization	\$36.7	\$42.6	\$73.3	\$53.6	\$25.9	\$232.1	
Total	\$172.3	\$287.0	\$520.3	\$740.5	\$410.8	\$2,130.9	
New Thermal Generation	\$21.5	\$22.5	\$0.0	\$0.0	\$0.0	\$44.0	
Total including New Thermal Gen	\$193.7	\$309.5	\$520.3	\$740.5	\$410.8	\$2,174.8	
Grid Modernization Subtotal	\$94.0	\$141.7	\$173.0	\$177.1	\$166.2	\$751.9	
Grid Mod Percentage (%)	55%	49%	33%	24%	40%	35%	

This reported investment plan reflects Liberty-Empire's full budget, not just focused on PISA-eligible spend.

AFUDC is not included in this report and investment plan summary.

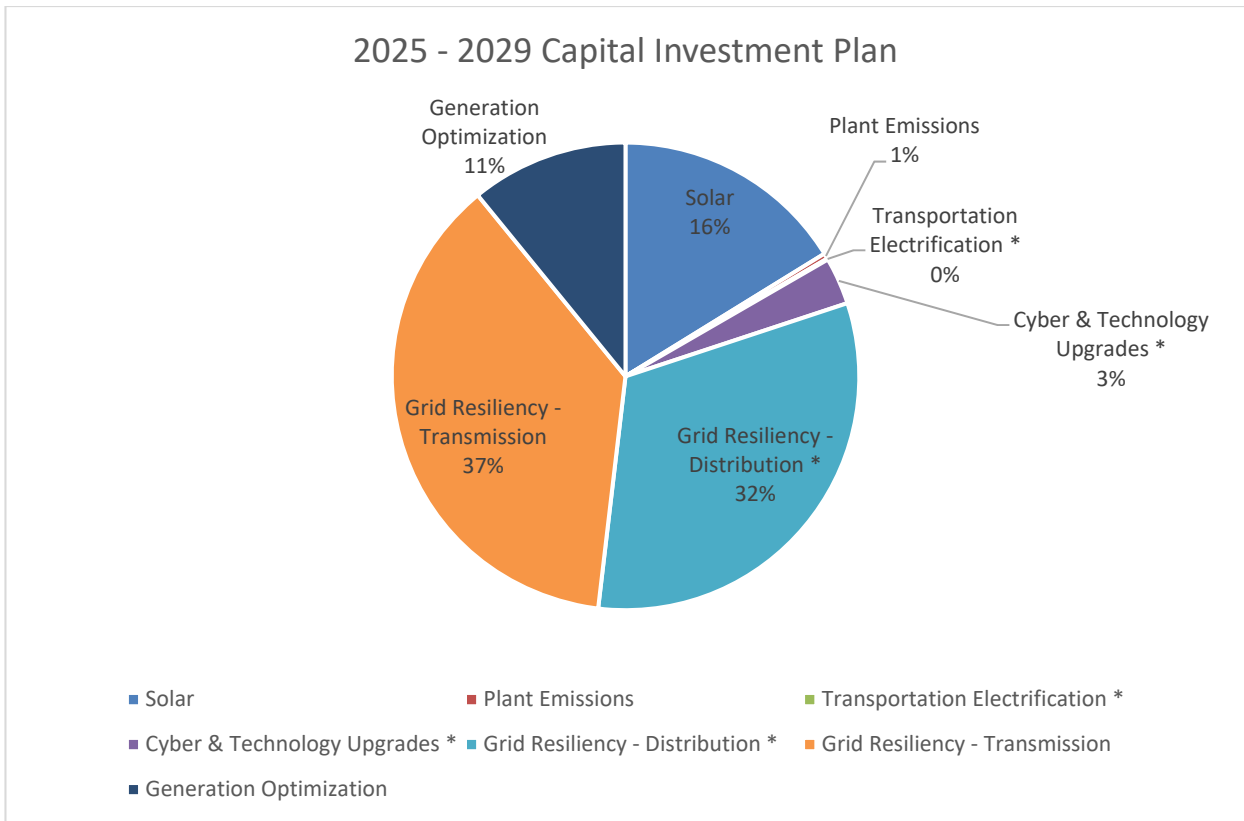
Planned costs for retirement projects are not included in this report and investment plan summary.

* Included in the Grid Modernization subtotal.

9
 10 As shown in the pie chart below, Distribution spending is approximately 32% of
 11 Empire’s Capital Investment Plan over 2025 - 2029.

¹⁰ EO-2019-0046, The Empire District Electric Company, d/b/a Liberty, 2025 PISA Report, page 5.

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3 Q. Does Empire's distribution capital investment plan include reliability
4 improvement programs?

5 A. ** Yes. ** Chapter 23 requires each electric utility to provide Staff a
6 summary report detailing all programs scheduled for the upcoming calendar year designed to
7 maintain or improve service reliability. The reports are required to include the status and
8 funding of the programs.

9 Q. On page 21, lines 8-22, Mr. Westfall mentions the reliability improvement
10 programs and the stipulation and agreement in ER-2021-0312. Please state and explain the
11 purpose of the agreement term from Staff's perspective.

1 A. In the Second Partial Stipulation and Agreement in ER-2021-0312,
2 Empire agreed:

3 . . . to update the status of its reliability improvement projects and
4 expenditures in a format similar to Schedule JW-1 of Jeff Westfall's
5 direct testimony, with Staff and Empire to meet first to discuss the goals
6 of the increased reporting. The additional information will be included
7 with the reliability improvement program annual report currently
8 required by the Commission's rule and will be submitted as a non-case
9 filing in EFIS.

10 In short, Staff sought additional detail in the non-case related filings made regarding
11 reliability improvement programs¹¹ to better understand how those programs were considered
12 in the overall capital budget.

13 Q. Does Staff have any concerns regarding the information reported?

14 A. In preparing this testimony, I noticed that ** the 2025 reliability improvement
15 program detail provided in BRIP-2025-0293 does not match the 2025 capital investment plan
16 filed a few months later in EO-2019-0046. ** Staff requested clarification¹² however I suspect
17 the differences may be due to timing of the finalization of Empire's budget. Staff recommends
18 Empire request a variance to allow for the reporting of its reliability improvement program on
19 the same day of its capital investment plan filing to ensure the filings are consistent.¹³

20 Q. Does Staff have any other concerns regarding Empire's compliance with the
21 Commission's rules regarding reliability metrics?

22 A. Yes. Empire implemented a new database for recording outage related data and
23 reporting metrics in April 2024. It is Staff's understanding that now Empire uses the most recent

¹¹ 20 CSR 4240-23.010(9).

¹² Staff Data Request 0452 in this case is due August 20, 2025.

¹³ 20 CSR 4240-23.010(9) requires the Reliability Improvement Program report be transmitted no later than the last business day of December each year.

1 Institute of Electrical and Electronics Engineers (IEEE) Standard 1366-2022, Guide for Electric
2 Power Distribution Reliability Indices whereas the Commission’s rule requires an older
3 standard, 2003. Staff is not necessarily opposed to the use of the newer standard; however,
4 Empire did not request a variance from the existing rule. Further, the purpose of specifying the
5 standard in the rule is so that all the regulated utilities are utilizing a consistent method for its
6 indices and for Staff and the Commission to understand the basis for the methods used. At this
7 time, Staff does not own a copy of the newer standard. Staff recommends Empire file a
8 variance case with the Commission to allow Staff the opportunity to evaluate the new standard.
9 Staff intends to further evaluate revisions to the reliability rule.

10 **INFRASTRUCTURE INSPECTIONS**

11 Q. On page 10, line 8-13 of OPC witness Jordan Seaver’s direct testimony,
12 he discusses the “blatant effect” of Empire’s management of the Customer First project on grid
13 maintenance and upgrade projects noting the “lack of almost any infrastructure inspections done
14 in 2024.” Please explain the infrastructure inspections required.

15 A. Commission rule 20 CSR 4240-23.020 regarding Electrical Corporation
16 Infrastructure Standards requires the electrical corporations to “conduct inspections of
17 its transmission and distribution facilities operated above six hundred (600) volts, as
18 necessary... but in no case may the period between inspections (measured in years) exceed the
19 time specified in the table, included herein, titled “Electrical Corporation System Inspection
20 Cycles (Maximum Intervals in Years)”. The timeline for completion varies by component
21 type (for example wood vs non-wood poles) but generally inspections are conducted in cycles
22 of 4, 6, 8, or 12 years. In other words, the rule does not require an entire system to be inspected

1 every year. In fact, the rule allows the utilities some flexibility in meeting the standards of
2 the rule. Specifically, regarding the reporting requirements in 20 CSR 4240-23.020(3)(C),
3 an electrical corporation is required to “identify those facilities that were scheduled for
4 inspection but that were not inspected according to schedule and shall explain why the
5 inspections were not conducted, and provide the electrical corporation’s recovery plan to
6 perform the required inspections.”

7 Q. Did Empire identify the inspections that were not completed, explain why the
8 inspections were not conducted, and provide a recovery plan?

9 A. Yes. While there was not a great level of detail provided by Empire on the lack
10 of infrastructure inspections, Empire did comply with the rule.

11 Q. Did Staff meet with Empire regarding the 2024 planned infrastructure
12 inspections?

13 A. Yes. Empire reached out to Staff on June 29, 2025, to set up a call. Staff met
14 virtually with Empire on July 7, 2025, after Empire’s infrastructure inspection report was filed
15 with the Commission.

16 Q. Please summarize Empire’s 2024 planned inspections and completed
17 inspections in calendar year 2024.

18 A. The tables below present Empire’s plan for 2024 distribution and transmission
19 infrastructure inspections and actual inspections completed during 2024:¹⁴

¹⁴ Report filed in EO-2026-0002, pages 5 and 6. Values as reported Staff is still conducting discovery.

1

2024 Distribution Inspection Plan Summary					
Inspection Type	Facility Type	Components	Inspections Planned for 2024	Inspections Completed During 2024	Inspections Not Completed in 2024
Patrol	Overhead Circuits, Structures, & Equipment	Poles, Transformers, Capacitors, Regulators, Reclosers, Switches	36,149	0	36,149
	Streetlight System	Structures	323	0	323
	Underground Structures & Equipment	Sectionalizing Cabinets, Vaults, Transformers, Switches	3,442	0	3,442
Detail	Overhead Circuits, Structures, & Equipment	Poles, Transformers, Capacitors, Regulators, Reclosers, Switches	30,877	719	30,158
	Streetlight System	Structures	166	0	166
	Underground Structures & Equipment	Sectionalizing Cabinets, Vaults, Transformers, Switches	3,602	0	3,602
Intrusive	Wood Poles	Poles	17,061	8,780	8,281

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2024 Transmission Inspection Plan Summary					
Inspection Type	Facility Type	Components	Inspections Planned for 2024	Inspections Completed During 2024	Inspections Not Completed in 2024
Patrol	Overhead Structures & Equipment	Poles	15,553	15,553	0
Detail	Overhead Structures & Equipment	Poles, Switches	4,360	0	4,360
Intrusive	Overhead Structures & Equipment	Poles	1,153	0	1,153

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As the tables above show, for its distribution system, Empire was able to complete some of its detailed overhead circuit inspections and intrusive pole inspections; and for its

1 transmission system, Empire completed its patrol inspections of its poles. Empire plans to
2 complete all 2024 planned inspections by the end of 2025.¹⁵

3 Q. Is Staff concerned with the lack of planned infrastructure inspections completed
4 during 2024?

5 A. Yes. It is concerning that in most categories of inspections Empire did not
6 complete any of its planned inspections. Additionally, Empire failed to complete all its work
7 requiring corrective action. Staff is further investigating Empire's reasoning in the context of
8 the investigatory docket OO-2025-0233 in particular because Empire pointed to
9 implementation of new software as part of the reason for delay. However, Empire plans to
10 complete the remaining 2024 planned inspections in 2025 and the remaining corrective actions
11 for 2024 in 2025.¹⁶ In response to Staff Data Request 0003 and 0005 in EO-2026-0002,
12 Empire notes it is on schedule to complete the 2024 and 2025 scheduled inspections.

13 Q. Are you aware of other instances where electric utilities have struggled to
14 complete their planned infrastructure inspections during a particular calendar year?

15 A. Yes. In 2018, Ameren Missouri's inspections were disrupted by certain factors,
16 including deployment of resources to assist in the restoration of electric services to Puerto Rico
17 after Hurricane Maria. Ameren Missouri requested a variance¹⁷ from the applicable commission
18 rule.¹⁸ In its report and order denying the variance the Commission stated it "appreciates that
19 Ameren Missouri chose to request a variance ahead of the reporting time, rather than risk a

¹⁵ Report filed in EO-2026-0002, pages 5 and 6.

¹⁶ EO-2026-0002, pages 11 and 13.

¹⁷ EE-2019-0076.

¹⁸ At that time 4 CSR 240-23.020(3)(C).

1 violation of the rule. However, since no variance or wavier is needed, the Commission will
2 deny the request.”

3 Q. Mr. Seaver asserts that “Empire’s cost of contracting [the inspection] work by
4 these companies that Empire should have completed should not be recovered from Empire’s
5 customers through Empire’s rates.” Do you agree?

6 A. No. Mr. Seaver appears to argue that only Empire employees should complete
7 infrastructure inspections. However, Empire has contracted some of this work out since 2008.¹⁹

8 Q. What other actions could the Commission make regarding infrastructure
9 inspections?

10 A. The Commission may prescribe changes to an individual utility’s obligations
11 relating to reporting and record keeping formats and forms when necessary.²⁰ Staff may make
12 additional recommendations in surrebuttal testimony or in Case No. OO-2025-0233 after
13 additional discovery.

14 Q. Does this conclude your testimony?

15 A. Yes.

¹⁹ EO-2024-0371, filed July 1, 2024, page 4.

²⁰ 20 CSR 4240-23.020(3)(B).

BEFORE THE PUBLIC SERVICE COMMISSION

OF THE STATE OF MISSOURI

In the Matter of the Request of The Empire)
District Electric Company d/b/a Liberty for) Case No. ER-2024-0261
Authority to File Tariffs Increasing Rates)
for Electric Service Provided to Customers)
in Its Missouri Service Area)

AFFIDAVIT OF CLAIRE M. EUBANKS, PE

STATE OF MISSOURI)
) ss.
COUNTY OF COLE)

COMES NOW CLAIRE M. EUBANKS, PE and on her oath declares that she is of sound mind and lawful age; that she contributed to the foregoing *Rebuttal Testimony of Claire M. Eubanks, PE*; and that the same is true and correct according to her best knowledge and belief.

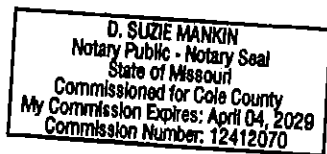
Further the Affiant sayeth not.

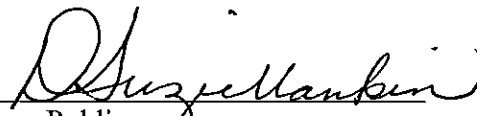


CLAIRE M. EUBANKS, PE

JURAT

Subscribed and sworn before me, a duly constituted and authorized Notary Public, in and for the County of Cole, State of Missouri, at my office in Jefferson City, on this 15th day of August 2025.





Notary Public