Exhibit No.:	
Issue(s):	*Class Cost of Service and Rate Design, Energy Efficiency Adjustment*
Witness:	*Hari K. Poudel, PhD*
Sponsoring Party:	*MoPSC Staff*
Type of Exhibit:	*Surrebuttal / True-Up Direct Testimony*
Case No.:	*ER-2024-0261*
Date Testimony Prepared:	*September 17, 2025*

MISSOURI PUBLIC SERVICE COMMISSION

INDUSTRY ANALYSIS DIVISION

TARIFF AND RATE DESIGN DEPARTMENT

SURREBUTTAL / TRUE-UP DIRECT TESTIMONY

OF

HARI K. POUDEL, PhD

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

CASE NO. ER-2024-0261

Jefferson City, Missouri
September 2025

** Denotes Confidential Information **

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CASE NO. ER-2024-0261

Q. Please state your name and business address.

A. My name is Hari K. Poudel, and my business address is P. O. Box 360, Jefferson City, Missouri 65102.

Q. Are you the same Hari K. Poudel, PhD, who provided direct testimony in this matter, filed on July 2, 2025; rate design direct testimony on July 21, 2025; and rebuttal testimony in this case on August 18, 2025?

A. Yes.

EXECUTIVE SUMMARY

Q. What is the purpose of your surrebuttal / true-up direct testimony?

A. The purposes of my surrebuttal / true-up testimony are:

1. To perform the energy efficiency adjustment analyses that ends on March 31, 2025;
2. To respond to Midwest Energy Consumers Group ("MECG") witness Kavita Maini, concerning the Average and Excess ("A&E") production allocator calculation workpaper;
3. To provide information regarding the corrected workpaper for the A&E production allocator; and,

4. To respond to Empire witness Timothy S. Lyons concerning Empire's residential rate design approach.

ENERGY EFFICIENCY ADJUSTMENT

Q. Does Staff perform energy efficiency adjustments by rate code for both residential and non-residential rate classes?

A. Yes. Staff performed an energy efficiency adjustment per rate code for both residential and non-residential rate classes. Staff performed adjustment analyses for the Small General Service ("SGS"), Large General Service ("LGS"), and SPS Small Primary Service ("SPS") classes at the rate code level.

Q. What is Staff's recommended Surrebuttal / true-up energy efficiency adjustment to be applied to the level of current revenues and billing determinants?

A. Staff's total energy efficiency adjustment is ** [redacted] ** for the true-up period ending March 31, 2025.

Q. Through this testimony, do you describe the development of a work product that you provided to other Staff witnesses for the development of an issue in this case?

A. Yes. Development of the true-up energy efficiency adjustment is the result of the same process described in my direct testimony, used by Staff witnesses Kim Cox and Marina Gonzales to determine total revenue billing determinants. To represent the effect of the energy efficiency adjustment on Empire's revenue, the true-up energy efficiency adjustment is applied to revenue billing determinants.

Q. Why does Staff need to true-up the energy efficiency adjustment?

A. The true-up energy efficiency adjustment has the goal of quantifying the impact of the energy efficiency measures that were implemented between the direct filing and the true-up ending on March 31, 2025.

A&E PRODUCTION ALLOCATOR

Q. What is an allocator?

A. An allocator is a percentage breakdown of the selected cost driver among classes based on cost causation principles. Within each broad type of classification, utilities use multiple allocators for various cost categories.

Q. Did MECG's witness Ms. Maini alert Staff to issues related to its A&E production allocator calculation?

A. In part, yes. Ms. Maini stated on page 4 of her rebuttal testimony that "Staff incorrectly applies the same loss factor for the transmission class as is used for the residential and other classes that take service at the secondary voltage service level," and Ms. Maini also noted a concern with double-counting energy for EV charging load. Staff reviewed its workpapers and determined that, while the correct allocator calculation was made in my actual workpaper, the copy I prepared, "A&E workpaper_Poudel", contained a mismatch that showed the errors Ms. Maini observed. The parties were informed of this error as soon as it was discovered, and a corrected workpaper was distributed.

Q. Does Ms. Maini have any issues with the peak demand value that was used in the A&E production allocator calculation?

A. Yes.

Q. What is Ms. Maini concerned about regarding the non-coincident demand peak data for the transmission service?

A. Ms. Maini stated that the average demand is higher than the 2NCP demand for the transmissions class. She correctly identifies that the "peak" demand that Staff used in the A&E production allocator calculation for the Transmission Service class is less than the "average" demand used in the allocator calculation for that class.

Q. Is this a concern in the context of this case?

A. No. The peak demand Staff used for the Transmission class was 7,682 kW, and the "average" demand used was 7,856 kW, or about 2.2% higher.[1] This difference is attributable to three factors, and review of these factors does not change the Staff's recommendation.

First, the non-coincident peaks used in an A&E calculation are not necessarily the hours of the highest usage for a given class during the year, but rather, the highest usage hour of that class (in this case, that one customer) during the months selected for evaluation, in this case, July and January. The Transmission customer actually had its largest peaks in April and May.

** [redacted] **

Second, the data set for peak information is different than the data set for usage information. In this case, there is ample room for concern that neither data set is fully reliable, which could result in mismatches of data. However, that concern permeates this case and is no more applicable to the Transmission class than any other.

[1] There is currently one customer in the Transmission Service class.

Third, "average" demand in the A&E calculation is simply the total energy units divided by the measure of peak used in the A&E calculation. Since the Transmission customer uses relatively close to the same amount of energy in every hour, and the hours used for peaks were not the hours when it used the most energy, it is not surprising that this calculation of "average," was a little bit higher than the average of the July and January NCP peaks for that customer.

The issue Ms. Maini identifies actually results in the Transmission class being allocated about 2% less than they otherwise would, and is a good illustration of the shortcomings of the A&E method.

Q. Is there any issue that Staff raised related to the data quality used for the A&E production allocation calculation?

A. Yes. Staff witness Ms. Lange discussed the data quality issue for the A&E allocator calculation in her direct testimony.[2] The Office of the Public Counsel ("OPC") witness Dr. Geoff Marke also mentioned on page 20 of his rebuttal testimony that he has no faith in the billing determinants that were used in the rate design and class cost of service studies.

RATE DESIGN APPROACH

Q. Mr. Lyons argued on page 22 of his rebuttal that the basic customer method understates residential customer costs because the approach does not include Federal Energy Regulatory Commission ("FERC") accounts 364 through 368.[3] Mr. Lyons testifies that

[2] ER-2024-0261 Staff Witness Sarah L.K. Lange, Direct Testimony, Page 58, Lines 9-16 "Given the limited data available, Staff's study does not attempt to refine allocations of distribution costs and components to the extent necessary to review the reasonableness of intraclass revenue responsibility as reflected in rate design." "Due to concerns with "the reliability of hourly data, Staff relies on an A&E allocation of dispatchable generation facilities. In general, these shortcomings tend to over allocate revenue responsibility to Residential and General Service customers, and to under allocate revenue responsibility to Large General Service, Small Primary Service, and Large Power Service customers."

[3] FERC account descriptions for each are 364 Poles, Towers, & Fixtures, 365 Overhead Conductors, 366 Underground Conductors, 367 Underground Conduit, and 368 Line Transformers.

"The Company believes a portion of distribution plant and expenses vary by the number of customers because there is a statistically significant relationship between the Company's poles and its number of customers."[4] Does Staff agree?

A. No. Mr. Lyons asserted that there is a strong correlation between the number of poles and the number of consumers, and he demonstrated a statistically significant relationship between number of poles and the number of customers between 2014 and 2023 in his rebuttal testimony.[5] However, even if a relationship is statistically significant, that does not necessarily mean it is significant in the sense of meaningful or important. On page 9 of his rebuttal, Mr. Lyons provided a regression analysis with a R-squared value of 0.9176 explaining that 91.76 percent of changes in poles can be explained by changes in the number of customers. However, a large value of R-squared only demonstrates the proportion of variance in the number of poles that the number of customers explain. However, even if the R-squared from Mr. Lyons' analysis is valid, this does not prove a cause-and-effect relationship between customers and number of poles. In fact, confusing correlation with cause-and-effect is the most common misconception in using regression that all analysts must guard against since spurious correlation happens so frequently. To demonstrate, consider an example of spurious correlation that underscores the coincidence. The per capita cheese consumption in the United States shows a high correlation with the incidence of fatalities resulting from tangling in bedsheets. While cheese consumption and strangulation by bedsheets occurs concurrently enough nationwide to yield a 0.826 R-squared,[6] this is clearly not a causal relationship and not based

[4] ER-2024-0261 Rebuttal Lyons Page 9, Lines 6-8.
[5] ER-2024-0261 Rebuttal Lyons Page 9, Lines 11-12.
[6] Pero Hrabac and Bladimir Trkulja, *Of cheese and bedsheets – some notes on correlation*, 2020, National Library of Medicine, PubMed Central, available at https://pmc.ncbi.nlm.nih.gov/articles/PMC7358684/. Additional examples of this phenomenon can be found at https://www.datasciencecentral.com/spurious-correlations-15-examples/ or https://www.statology.org/spurious-correlation-examples/.

in logic. This is simply a random coincidence that arose from the analysis of large datasets. It is a caution against inferring causal relationships from a single correlation. This is particularly true when the sample size is small, as it is in Mr. Lyons analysis. Therefore, Mr. Lyons' analysis does not establish a cause-and-effect relationship. The cost causation principle states that the parties that are responsible for the costs that are incurred should be responsible for paying those costs.

Staff's use of the basic customer method for customer charge calculation is also addressed in the Surrebuttal testimony of Sarah L.K. Lange.

RECOMMENDATION AND CONCLUSION

Q. What is your recommendation related to the energy efficiency adjustment and customer charge?

A. I recommend the Commission to use the energy efficiency adjustment for the true-up period that Staff has provided to include in Staff's revenue requirement and rate design.

Q. Does this conclude your surrebuttal/true-up direct testimony?

A. Yes, it does.

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 Authority to File Tariffs Increasing Rates for Electric Service Provided to Customers in Its Missouri Service Area	)))))	Case No. ER-2024-0261

AFFIDAVIT OF HARI K. POUDEL, PhD

STATE OF MISSOURI)
) ss.
COUNTY OF COLE)

COMES NOW HARI K. POUDEL, PhD and on his oath declares that he is of sound mind and lawful age; that he contributed to the foregoing *Surrebuttal / True-Up Direct Testimony of Hari K. Poudel, PhD*; and that the same is true and correct according to his best knowledge and belief.

Further the Affiant sayeth not.

HARI K. POUDEL, PhD

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 10th day of September 2025.

D. SUZIE MANKIN
Notary Public - Notary Seal
State of Missouri
Commissioned for Cole County
My Commission Expires: April 04, 2029
Commission Number: 12412070

Notary Public