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Witness: *Hari K. Poudel, PhD*
Sponsoring Party: *MoPSC Staff*
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Case No.: *ER-2024-0261*
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MISSOURI PUBLIC SERVICE COMMISSION

INDUSTRY ANALYSIS DIVISION

TARIFF AND RATE DESIGN DEPARTMENT

DIRECT TESTIMONY

OF

HARI K. POUDEL, PhD

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

CASE NO. ER-2024-0261

Jefferson City, Missouri
July 21, 2025

TABLE OF CONTENTS OF

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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 case on July 2, 2025?

A. Yes.

EXECUTIVE SUMMARY

Q. What is the purpose of your Rate Design direct testimony?

A. I will present the results of Staff's Comparison Class Cost of Service ("CCOS") study, "Study B," using Empire's[1] distribution classifications. I also provide a review of the market energy pricing and the Off-Peak kWh credit rate. I also calculate the Average and Excess ("A&E") production allocation that is used in Staff's CCOS studies. In addition, I will discuss the residential rate design, including residential customer charge cost of service. Finally, I provide Staff's recommendation regarding the tail block rate.

REVIEW OF ENERGY PRICING

Q. Did you review the energy prices for each customer class?

A. Yes. Using the actual hourly loads provided by Empire, I found the annual non-normalized energy expense for each customer class under two pricing scenarios – the actual Southwest Power Pool ("SPP") Locational Marginal Pricing ("LMP"), and the

[1] The Empire District Electric Company, d/b/a Liberty ("Empire").

normalized LMPs developed by Staff for use in Staff's production model. I then found the average price for different Service Classifications, provided below:

Season - Time	Residential	General Service	Large General	Small Primary	Large Power	Transmission	Lighting	EV
Summer Differential	0.0189	0.0194	0.0185	0.0176	0.0174	0.0170		
Non-Summer Differential	0.0079	0.0082	0.0094	0.0095	0.0101	0.0094	0.0106	0.0167

Q. Does this review indicate that it is appropriate to continue time-based pricing?

A. Yes. Staff's review indicates that average cost of wholesale energy during the off-peak period of the Time Choice rate plan is lower than the average cost of wholesale energy during the remaining hours of the day. This differential occurs in both summer and non-summer seasons. Based on this review, Staff recommends no change to the overlay design of the Time Choice rate plans at this time.

CLASS COST OF SERVICE STUDY

Q. Did you prepare a CCOS study?

A. Yes. I have prepared an alternative to Staff's recommended CCOS study and recommended rate implementation in order to facilitate Commission review in this case. Specifically, this study, Study "B," relies on Empire's classification of customer-allocable distribution assets. In rebuttal, Staff will address why this classification is unreasonable.

Q. Why does Staff provide a CCOS study using Empire's classification of customer-allocable distribution assets?

A. While the revenue requirement is generally the primary driver of differences in the CCOS results submitted by various parties, it can be difficult for the Commission to differentiate between differences driven by allocator and classifier selection and differences driven by the revenue requirement calculation. Staff provides Study B for the Commission's reference in understanding the impact of the customer-allocable distribution assets.

Q. What are the results of Study B?

A. The study analyzes seven customer classes, determining how much each should contribute to Empire's revenue requirement based on Empire's classification of customer-allocable distribution asset, if all classes contributed equally to the rate of return. The results, excluding the Customer First disallowance recommended by Staff witness, James A. Busch, but including the disallowances recommended by Staff witnesses Matthew R. Young and Melanie Marek, are provided in the table below. Mr. Busch's disallowance is addressed separately in the recommended revenue allocation.

Customer Class	Proposed % increase	Over/(Under) Contribution ($)	Over/(Under) Contribution (%)
Residential	39%	-$25.7M	-25.8%
GS	15%	+$7.8M	+38.9%
LGS	18%	+$11.6M	+31.4%
SPS	10%	+$1.8M	+58.4%
LPS	19%	+$4.8M	+22.8%
Transmission	33%	-$0.24M	-16.8%
Lighting	29%	-$0.04M	-1.4%

	Residential	GS	LGS	SPS	LPS	Transmisison	Lighting
Retail Rates Subject to Adjustment	$ 248,723,854	$ 61,348,830	$ 113,803,768	$ 10,627,572	$ 68,014,268	$ 4,674,852	$ 6,537,778
% Increase	39%	15%	18%	10%	19%	33%	29%
Equal Percent Increase	$ 69,284,999	$ 17,089,449	$ 31,701,398	$ 2,960,437	$ 18,946,187	$ 1,302,236	$ 1,821,176
Over/(Under) Contribution $	$ (25,720,788)	$ 7,794,282	$ 11,572,753	$ 1,833,562	$ 4,801,712	$ (242,894)	$ (38,628)
Over/(Under) Contribution %	-25.79%	38.86%	31.44%	58.41%	22.78%	-16.76%	-1.36%

Q. If Study B were relied upon in this case, what shifts in revenue responsibility would be appropriate if based only on cost causation?

A. While Staff does not recommend reliance on Study B, under Study B, Staff's approach of holding classes within +/- 5% of the system average cost of service without changes to revenue responsibility, increasing the revenue responsibility of under contributing classes to within 5% of the system average cost of service, and providing a lower increase to classes over contributing to the system average cost of service, results in the following revenue responsibilities, including the Customer First disallowance recommended by Staff witness James A. Busch:

	Residential	GS	LGS	SPS	LPS	Transmisison	Lighting
Retail Rates Subject to Adjustment	$ 248,723,854	$ 61,348,830	$ 113,803,768	$ 10,627,572	$ 68,014,268	$ 4,674,852	$ 6,537,778
Hold	$ -	$ -	$ -	$ -	$ -	$ -	$ 1,821,176
Above Average	$ 90,860,157	$ -	$ -	$ -	$ -	$ 1,488,479	$ -
Below Average	$ -	$ 10,613,060	$ 22,910,593	$ 1,147,114	$ 14,265,303	$ -	$ -
Preliminary Recommended Increase to Adjustable Rates	$ 90,860,157	$ 10,613,060	$ 22,910,593	$ 1,147,114	$ 14,265,303	$ 1,488,479	$ 1,821,176
EDR Factor Up	$ -	$ -	$ -	$ (14,699)	$ (337,087)	$ -	$ -
EDR Factor Up Responsibility	$ 223,354	$ 26,089	$ 56,319	$ 2,820	$ 35,067	$ 3,659	$ 4,477
Recommended Revenue from Rates Subject to Adjustment	$ 339,807,365	$ 71,987,979	$ 136,770,680	$ 11,777,506	$ 82,314,639	$ 6,166,990	$ 8,363,431
Percent Increase to "Average" Customer Bill	36.62%	17.34%	20.18%	10.82%	21.03%	31.92%	27.92%
Responsibility Adjusted for Customer First	**$ 322,081,073**	**$ 71,987,979**	**$ 136,770,680**	**$ 11,777,506**	**$ 82,314,639**	**$ 6,166,990**	**$ 8,363,431**
Percent Increase to "Average" Customer Bill	**29.49%**	**17.34%**	**20.18%**	**10.82%**	**21.03%**	**31.92%**	**27.92%**

This is effectively the outer range of shifts possible if the Commission disagrees with Staff's class cost of service approach, but agrees with Staff's direct-filed revenue requirement.

Average & Excess Allocator Calculation

Q. Please describe the A&E production allocation method.

A. The A&E production allocation method uses a weighted average of the average-demand allocators (weight = system load factor[2]) and the Excess-Demand Allocators (weight = one minus the system load factor). The A&E methodology considers both class maximum demands and class load factor, but does not consider the coincidence of a class peak with the system peak. However, the A&E allocator can be prepared with very little information or effort.

Q. How does Staff calculate the production capacity allocator used in this case?

[2] Load Factor is an expression of how uniformly a customer uses energy across time, regardless of time of consumption or coincidence with the consumption of others. For example, two customers, A and B, each using 100-watt light bulbs. Customer A turns on all five of his/her 100-watt light bulbs for two hours. Customer B, by contrast, turns on two light bulbs for five hours. Both customers use the same amount of energy – 1,000 watthours or 1 kWh. However, Customer A imposed a higher demand, 500 watts per hour or 0.5 kW, than Customer B who demanded only 200 watts per hour or 0.2 kW. Although both customers had precisely the same kWh energy usage, Customer A's kW demand was 2.5 times Customer B's. However, the A&E method does not address whether Customer A's usage or Customer B's occurred at a time when system demand was high or low, which is the factor relevant to determining what level of capacity related costs are allocable to each.

A. Staff used an A&E 2NCP allocator consistent with the 1992 NARUC Cost Allocation Manual.[3] The non-coincident peak demand is the highest amount of energy used in an interval in a month by a customer class, regardless of the time or magnitude of individual customers within the class, or the level of aggregate usage of other classes or the system at that time. It differs from the coincident peak demand, which is the sum of demands at the exact time of the system peak.

Q. What are the results of A&E production allocation?

A. These results are provided in the table below:

	Res	General Service	Large General Service	Small Primary	Large Power	Transmission	Lighting	EV
Average:	0.24744	0.05943	0.14467	0.01457	0.10962	0.00954	0.00242	0.00003
Excess:	0.28626	0.04767	0.05100	0.00611	0.01560	(0.00049)	0.00611	0.00002
A&E 2NCP:	**0.53370**	**0.10711**	**0.19567**	**0.02067**	**0.12522**	**0.00905**	**0.00854**	**0.00005**

RATE DESIGN

Residential Customer Charge Cost Causation

Q. What cost of service is attributable to the residential customer charge?

A. Staff relied on the basic customer approach to the valuation of the residential customer charge. This approach includes in the charge calculation the revenue requirement associated with the following items:

1. Meters
2. Service Lines
3. A portion of Line Transformers
4. Customer-Allocated
5. Property Insurance
6. Employee Pensions & Benefits
7. Income Taxes

[3] According to page 50 of the 1992 NARUC Cost Allocation Manual, it is not a good idea to use a coincident peak ("CP") allocation factor to find out how average demand affects production plant costs. This is because it results in allocation factor that are the same as those found using a CP method. Instead, we should use the non-coincident peak ("NCP") to allocate the excess demands. "CP" refers to a given class's load in the hour in a given month (or year) when the system has the highest energy usage. NPC refers to the customer's maximum usage regardless of when it occurs in the system.

Staff's accounting schedules did not separately value billing and postage. Because not all customers receive a mailed bill, it is reasonable to assume that the average cost of billing and postage is less than $1 per customer per month. This results in a total customer charge cost of service of $9.61 per month. The customer charge calculation reflects the disallowances recommended by Staff witnesses Matthew R. Young and Melanie Marek, but does not include the disallowance recommended by Staff witness James A. Busch.

Q. What is Empire's current residential customer charge?

A. It is $13.00.[4]

Q. What is Staff's recommendation for the residential customer charge?

A. As discussed by Staff witness Sarah L.K. Lange, reducing the residential customer charge while increasing residential rates as whole considerably will exacerbate rate shock associated with the large increase contemplated in this case. To mitigate rate shock, Staff recommends retaining the existing customer charge, or increasing the customer charge by the overall percentage increase applicable to the residential class.

Q. What is Staff's recommendation for residential energy charges?

A. Staff recommends retention of the current level of the Off-Peak kWh credit, and equal percentage increases to all other residential energy charges.

Tail Block Rate

Q. What is a Tail Block Rate ("TBR")?

A. An applicable TBR is one of the factors in the throughput disincentive ("TD") that is necessary to recover that disincentive associated with Empire's energy efficiency program.[5] The TD is collected for a given month for a given Service Classification, and measured in dollars. The TBR factor reflects the rate in a given

[4] Docket No. YE-2021-0041; Tariff Revised Sheet No. 3.
[5] TD = [MS * TBR * NTGF] where MS = Monthly Savings, is the sum of the Program's monthly savings in kWh, for a given month for a given Service Classification; NTGF = Net-To-Gross-Factor.

period less net fuel costs. Theoretically, the TBR is applied to the TD calculation to reflect the portion of that revenue that contributes to fixed (non-energy-related) cost recovery of the company.

Q. Did Staff perform any calculation regarding TBR in this filing?

A. No.

Q. Does Staff have any recommendation on the TBR?

A. Yes. The monthly throughput disincentive is calculated by applying monthly (kWh) savings to the tail block rate applicable to each rate class and month. The TBR should be the actual rate in a given period less net fuel costs (i.e., base factor adjusted for losses). Therefore, Staff recommends modifying the definition of TBR on Tariff Sheet No. 21C[6] to include netting fuel costs at the time of the compliance tariff filing.

Q. Does this conclude your direct Rate Design testimony?

A. Yes. It does.

[6] Docket No. YE-2021-0041; Tariff Sheet No. 21C.

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 *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 14th day of July 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