Exhibit No.:	
Issue(s):	*System Energy Losses Jurisdictional Allocation Factors Loss_Study-FAC Voltage Adjustment Factors*
Witness:	*Alan J. Bax*
Sponsoring Party:	*MoPSC Staff*
Type of Exhibit:	*Direct Testimony*
Case Nos.:	*ER-2024-0261*
Date Testimony Prepared:	*July 2, 2025*

MISSOURI PUBLIC SERVICE COMMISSION

INDUSTRY ANALYSIS DIVISION

ENGINEERING ANALYSIS DEPARTMENT

DIRECT TESTIMONY

OF

ALAN J. BAX

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

CASE NO. ER-2024-0261

Jefferson City, Missouri
July 2025

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DIRECT TESTIMONY OF

ALAN J. BAX

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

CASE NO. ER-2024-0261

DIRECT TESTIMONY

OF

ALAN J BAX

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

CASE NO. ER-2024-0261

Q. Please state your name and business address?

A. Alan J. Bax, P.O. Box 360, Jefferson City, Missouri 65102.

Q. By whom are you employed and in what capacity?

A. I am employed by the Missouri Public Service Commission ("Commission") as an Associate Engineer in the Engineering Analysis Department of the Industry Analysis Division.

Q. Please describe your educational and work background.

A. My educational and work background is summarized in Schedule AJB-d1.

Q. Are you a member of any professional organizations?

A. Yes, I am a member of the Institute of Electrical and Electronic Engineers ("IEEE").

Q. Have you previously filed testimony before the Commission?

A. Yes. My case participation history with the Commission is listed in Schedule AJB-d1.

EXECUTIVE SUMMARY

Q. What is the purpose of your testimony?

A. The purpose of this testimony is to describe my calculation of the following inputs to Staff's direct case:

- System energy loss factor,
- Jurisdictional allocation factors for demand and energy, and,
- Voltage adjustment factors ("VAF").

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

A. Yes. I provided a system energy loss factor to Staff witness Michael L. Stahlman for his development of hourly loads that are subsequently considered in Staff's fuel model. I provided jurisdictional demand and energy allocation factors to Staff witness Angela Niemeier for use in Staff's EMS run, which are utilized in allocating related demand and energy revenues and expenses to the Missouri retail jurisdiction. Finally, I provided calculated VAFs to Staff witness Brooke Mastrogiannis, who utilized these VAFs in conjunction with the determination of Fuel Adjustment Rates ("FAR") that are reflected in the Fuel Adjustment Clause ("FAC").

Q. Please summarize the results of your analyses.

A. A summary of the results of my calculations is included in Schedule AJB-d2.

Q. Have there been issues concerning the sufficiency and accuracy of the data provided by Empire to Staff?

A. Yes.

Q. Please describe the existing issues with acquiring appropriate data.

A. Empire has had, and continues to have, issues regarding billing its customers timely and accurately in conjunction with its implementation of a new customer information software system. As Empire continues to correct, update, revise, etc., its billing information/statements provided to its customers, it has consequently revised data sets previously sent to Staff. Upon receipt of different data sets that may affect my calculations, I will consider updating these recommended results reflected in Schedule AJB-d2.

SYSTEM ENERGY LOSSES

Q. What are system energy losses?

A. System energy losses refer to the energy that is lost in the production, transmission and distribution of electricity, largely occurring in the electrical equipment (e.g., transmission and distribution lines, transformers, etc.) between a utility's generating sources and their respective customers' meters. For example, the losses associated with the heat produced in transmitting and distributing electricity along associated conductors. In addition, small fractional amounts of energy, either stolen (diversion) or not metered, are included in my calculation of system energy losses.

Q. How are system energy losses determined?

A. The base formula for calculating system energy losses is: the Net System Input ("NSI") equals the sum of "Retail Sales," "Wholesale Sales," "Company Use," and "System Energy Losses." This can be expressed mathematically as:

NSI = Retail Sales + Wholesale Sales + Company Use + System Energy Losses.

NSI, Company Use, Retail Sales and Wholesale Sales are known quantities; therefore, system energy losses may be calculated as follows:

System Energy Losses = NSI – Retail Sales - Wholesale Sales – Company Use.

The system energy loss factor is the ratio of system energy losses to NSI:

System Energy Loss Factor = System Energy Losses ÷ NSI

Q. How is NSI determined?

A. In addition to the relationship expressed in the equation above, NSI is also equal to the sum of net generation and the net interchange. Net generation is the total energy output of each generating station minus the energy consumed internally to enable its production of electricity at each plant. The output of each generation plant is continuously monitored and metered. Net interchange is the difference resulting from netting off-system purchases and off-system sales, and is also similarly monitored.

Q. What are Retail Sales, Wholesale Sales and Company Use and how are these values determined?

A. The Commission sets cost of service based rates for a utility's Missouri retail customers. However, not all sales are associated with a utility's provision of service to its Missouri retail customers. Empire has retail and wholesale customers in the state of Missouri. Retail Sales and Wholesale Sales represent the jurisdictional energy metered within a particular utility's system. Company Use is the electricity consumed at Empire's non-generation facilities, such as its corporate office building.

SYSTEM ENERGY LOSS FACTOR

Q. What is the system energy line loss factor for Empire?

A. The system energy line loss factor for Empire is 0.0676 of NSI.

Q. Which Staff witness used your calculated system energy loss factors?

A. I provided my calculated system energy loss factor to Staff witness Michael L. Stahlman.

ALLOCATIONS

Jurisdictional Allocations

Q. Please define the phrase "jurisdictional allocations".

A. Some costs incurred in serving customers in a particular jurisdiction may be directly assigned to that jurisdiction. The costs that are not directly assigned to a particular jurisdiction are allocated among the various applicable jurisdictions. Jurisdictional allocation refers to the process by which demand-related and energy-related costs are allocated to the applicable jurisdictions of the respective utility. Costs that do not vary significantly over the course of a year, or that do not vary with the amount of energy generated or consumed, such as the capital costs associated with generation and transmission plant, are typically allocated on the basis of demand (i.e., "demand related"). Variable costs, such as fuel and purchased power, are typically allocated on the basis of energy consumption (i.e., "energy related"). Demand-related and energy-related costs are divided between the respective applicable retail and wholesale operations. The application of a particular allocation factor is dependent upon the types of costs being allocated among the associated jurisdictions.

Q. Please describe the jurisdictions applicable to this case.

A. The Commission sets cost of service based rates for a utility's Missouri retail customers; however, not all the costs incurred by a utility are necessarily associated with its provision of service to its Missouri retail customers. Empire has retail customers in the states of Missouri, Kansas, Oklahoma, and Arkansas. In addition, Empire has a wholesale customer

in the state of Missouri. Retail sales in Missouri, Kansas, Oklahoma, and Arkansas, along with wholesale sales in Missouri[1] are described as sales occurring in five separate jurisdictions.

Demand Allocation Factor

Q. What is the definition of demand?

A. Demand refers to the rate of electric energy that is delivered to a system to meet the requirements of its customers, generally expressed in kilowatts or megawatts, either at an instant in time or as an average for a designated interval of time.

Q. What is the system peak demand?

A. System peak demand is the largest electric requirement that occurs on a utility's system within a specified period of time (e.g., hour, day, month, season, or year). In my analyses, I used hourly demands.

Q. Please explain the term "coincident peak" as it is used in determining demand allocation factors.

A. A coincident peak is the hourly contribution of each of Empire's five jurisdictions (Missouri Retail, Kansas Retail, Oklahoma Retail, and Arkansas Retail along with Wholesale Operations) that occur coincident to Empire's respective overall system peak demand, i.e., each individual jurisdiction contributing demand at the time of Empire's total overall system peak.

Q. What types of costs are allocated on the basis of demand?

A. Capital costs associated with generation and transmission plant, as well as certain operational and maintenance expenses, are allocated on this basis. This is appropriate

[1] Wholesale sales are included in the jurisdiction of the Federal Energy Regulatory Commission ("FERC").

because generation and transmission are planned, designed and constructed to meet a utility's anticipated demand.

Q. Why use peak demand as the basis for allocations?

A. Peak demand is the largest electric requirement occurring within a specified period of time (e.g., day, month, season, year) on a utility's system. In addition, for planning purposes, an amount must be included for meeting required contingency reserves. Since generation units and transmission lines are planned, designed, and constructed to meet a utility's anticipated system peak demands, plus required reserves, the contribution of each individual jurisdiction to these peak demands is the appropriate basis on which to allocate the costs of these facilities.

Q. What methodology did you use to determine the demand allocators?

A. I used what is known as the Twelve Coincident Peak ("12 CP") methodology. A 12 CP method is appropriate for a utility, like Empire, that experiences hourly peaks in both winter and summer months. A utility that experiences dominant seasonal demands in the four summer months (June to September), relative to the demands in the other eight months of a calendar year, could consider utilizing a Four Coincident Peak ("4 CP") methodology. A utility that does not experience similar peaks in both winter and summer months, but instead experiences a peak demand in one particular month within a calendar year, may consider utilizing a One Coincident Peak ("1 CP") methodology. The monthly demands reported for the months in calendar years 2022, 2023, and 2024, which include the test year and the update period for the current case, are consistent with the monthly demands in the reporting periods associated with the last several rate cases involving Empire.

Q. What are the demand allocation factors you determined in this case?

A. Staff has calculated the following demand allocation factors for the aforementioned applicable jurisdictions, based on kW data provided for the test year:

Allocator			**Jurisdiction**							
			Missouri		Kansas		Oklahoma		Arkansas	FERC
Retail			0.8843		0.0436		0.0379		0.0322	
Wholesale										0.0020

Q. Which Staff witness used your jurisdictional demand allocation factors?

A. I provided these jurisdictional demand allocation factors to Staff witness Angela Niemeier in allocating demand related costs to the respective applicable jurisdictions.

Energy Allocation Factor

Q. What types of costs were allocated on the basis of energy?

A. Variable expenses, such as fuel and purchased power, along with certain operational and maintenance ("O&M") expenses, are allocated to the applicable jurisdictions based on energy consumption.

Q. How did you calculate the energy allocation factor?

A. The energy allocation factor for an individual jurisdiction in Empire is the ratio of the normalized annual kilowatt-hour ("kWh") usage in the particular jurisdiction, during the test year period in this case (October 2022 – September 2023), to Empire's respective overall total system kWh usage. Staff also applied adjustments to these normalized kWhs accounting for losses, anticipated growth and certain customer annualizations. Normalized weather

adjustments were provided by Staff witness Michael L. Stahlman. The adjustments for growth and certain annualizations were provided by Staff witness Kim Cox.

Q. What are the energy allocation factors you determined in this case?

A. Staff has calculated the following energy allocation factors for the aforementioned applicable jurisdictions based on kWh usage data in the test year, including the aforementioned adjustments:

Allocator			**Jurisdiction**				
			Missouri		Non-Missouri		FERC
Retail			0.8801		0.1178		
Wholesale							0.0022

Q. Which Staff witness used your jurisdictional energy allocation factors?

A. I provided these jurisdictional energy allocation factors to Staff witness Angela Niemeier in allocating energy related costs to the respective applicable jurisdictions.

LOSS STUDY

Q. Did Empire provide a Loss Study in this case on which you relied, in whole or in part, in developing Staff's loss factors for Staff's direct case?

A. Yes, a document entitled "Liberty Utilities / Empire District Electric Company - 2023 Analysis of System Losses" ("Loss Study"), was provided by Empire in an updated Response to Staff Data Request No. 0124 on January 21, 2025.

Q. Please provide a brief description of this document.

A. The Loss Study includes an analysis of system energy losses that is based upon data pertaining to the operation of Empire's total system collected during calendar year 2023, with a preparation date of January 2025.

Q. Why was this Loss Study provided?

A. Empire has initiated and maintained an FAC. In order to remain in compliance with the applicable Commission regulation 20 CSR 4240-20.090(13),[2] it was necessary for Empire to submit a current loss study in conjunction with their request to continue a Rate Adjustment Mechanism ("RAM"), such as their FAC, in the current case.

Q. What information are you evaluating in the Loss Study?

A. Included in the analysis of Empire's overall system line losses is a derived loss factor for each of the corresponding operating voltage levels (transmission, primary and secondary) in which Empire serves its customers.

Q. What are these voltage adjustment factors ("VAF") for each operating level of the Empire's system?

A. VAFs are determined to account for the energy losses experienced in the delivery of electricity from the generation level to the customer. I determined the VAFs applicable to the transmission, primary and secondary operating voltage levels[3] utilizing information concerning losses and energy sold at each specific voltage level contained in the loss study:

[2] 20 CSR 4240-20.090(13) Rate Design of the RAM. The design of the RAM rates shall reflect differences in losses incurred in the delivery of electricity at different voltage levels for the electric utility's different rate classes as determined by periodically conducting Missouri jurisdictional system loss studies. …When the electric utility seeks to continue or modify its RAM, the end of the twelve- (12) month period of actual data collected that is used in its Missouri jurisdictional system loss study must be no earlier than four (4) years before the date the utility files the general rate proceeding seeking to continue or modify its RAM.

[3] These VAFs for each of the respective voltage levels are illustrated in Schedule AJB-d2.

Voltage Level		**Factor**
$VAF_{Transmission}$		1.0376
$VAF_{Primary}$		1.0534
$VAF_{Secondary}$		1.0748

Q. Who were the members of Staff that used these VAFs?

A. These VAFs were provided to Staff witness Brooke Mastrogiannis for utilization in the determination of FARs that are reflected in Empire's FAC. These FARs will be applied to the individual voltage service classification of a particular customer should the Commission authorize Empire to continue utilizing its FAC and associated tariffs.

Q. Does this conclude your 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 ALAN J. BAX

STATE OF MISSOURI	)	
	)	ss.
COUNTY OF COLE	)	

COMES NOW ALAN J. BAX and on his oath declares that he is of sound mind and lawful age; that he contributed to the foregoing *Direct Testimony of Alan J. Bax*; and that the same is true and correct according to his best knowledge and belief.

Further the Affiant sayeth not.

ALAN J. BAX

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 26th day of June 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

ALAN J. BAX

I graduated from the University of Missouri - Columbia with a Bachelor of Science degree in Electrical Engineering in December 1995. Concurrent with my studies, I was employed as an Engineering Assistant in the Energy Management Department of the University of Missouri – Columbia from the Fall of 1992 through the Fall of 1995. Prior to this, I completed a tour of duty in the United States Navy, completing a course of study at the Navy Nuclear Power School and a Navy Nuclear Propulsion Plant. Following my graduation from the University of Missouri - Columbia, I was employed by The Empire District Electric Company as a Staff Engineer until August 1999, at which time I began my employment with the Staff of the Missouri Public Service Commission. My current position is an Engineer in the Engineering Analysis Department, within the Industry Analysis Division. I presented in a Peer Review of Power Quality Regulations in the National Association of Regulatory Utility Commissioners ("NARUC") outreach program with the Public Utilities Commission of Sri Lanka ("PUCSL"), supported by the Bureau of Energy Resources ("ENR") at the United States Department of State. I am a member of the Institute of Electrical/Electronic Engineers ("IEEE").

TESTIMONY AND REPORTS
BEFORE THE MISSOURI PUBLIC SERVICE COMMISSION

BY ALAN J. BAX

COMPANY	CASE NUMBER
Aquila Networks – MPS	ER-2004-0034
Union Electric Company d/b/a AmerenUE	EO-2004-0108
Empire District Electric Company	ER-2002-0424
Kansas City Power and Light Company	EA-2003-0135
Union Electric Company d/b/a AmerenUE	EO-2003-0271
Aquila Networks – MPS	EO-2004-0603
Union Electric Company d/b/a AmerenUE	EC-2002-0117
Three Rivers and Gascosage Electric Coops	EO-2005-0122
Union Electric Company d/b/a AmerenUE	EC-2002-1
Aquila Networks – MPS	EO-2001-0384
Empire District Electric Company	ER-2001-299
Aquila Networks – MPS	EA-2003-0370
Union Electric Company d/b/a AmerenUE	EW-2004-0583
Union Electric Company d/b/a AmerenUE	EO-2005-0369
Trigen Kansas City	HA-2006-0294
Union Electric Company d/b/a AmerenUE	EC-2005-0352
Missouri Public Service	ER-2001-672
Aquila Networks – MPS	EO-2003-0543
Kansas City Power and Light Company	ER-2006-0314
Macon Electric Coop	EO-2005-0076
Aquila Networks – MPS	EO-2006-0244
Union Electric Company d/b/a AmerenUE	EC-2004-0556
Union Electric Company d/b/a AmerenUE	EC-2004-0598
Empire District Electric Company	ER-2004-0570
Union Electric Company d/b/a AmerenUE	EC-2005-0110
Union Electric Company d/b/a AmerenUE	EC-2005-0177
Union Electric Company d/b/a AmerenUE	EC-2005-0313
Empire District Electric Company	EO-2005-0275
Aquila Networks – MPS	EO-2005-0270
Union Electric Company d/b/a AmerenUE	EO-2006-0145
Empire District Electric Company	ER-2006-0315

COMPANY	CASE NUMBER
Aquila Networks – MPS	ER-2005-0436
Union Electric Company d/b/a AmerenUE	EO-2006-0096
West Central Electric Cooperative	EO-2006-0339
Kansas City Power and Light Company	ER-2006-0314
Union Electric Company d/b/a AmerenUE	EO-2008-0031
Union Electric Company d/b/a AmerenUE	EC-2009-0193
Empire District Electric Company	ER-2008-0093
Missouri Rural Electric Cooperative	EO-2008-0332
Grundy Electric Cooperative	EO-2008-0414
Osage Valley Electric Cooperative	EO-2009-0315
Union Electric Company d/b/a AmerenUE	EO-2009-0400
Union Electric Company d/b/a AmerenUE	EO-2008-0310
Aquila Networks – MPS	EA-2008-0279
West Central Electric Cooperative	EO-2008-0339
Empire District Electric Company	EO-2009-0233
Union Electric Company d/b/a/ AmerenUE	EO-2009-0272
Empire District Electric Company	EO-2009-0181
Union Electric Company d/b/a AmerenUE	ER-2008-0318
Kansas City Power and Light Company	ER-2009-0089
Kansas City Power and Light – GMO	ER-2009-0090
Union Electric Company d/b/a AmerenUE	ER-2010-0036
Empire District Electric Company	ER-2010-0130
Laclede Electric Cooperative	EO-2010-0125
Union Electric Company d/b/a AmerenUE	EC-2010-0364
Union Electric Company d/b/a AmerenUE	EO-2011-0052
Kansas City Power and Light Company	ER-2010-0355
Union Electric Company d/b/a AmerenUE	EO-2010-0263
Kansas City Power and Light – GMO	EO-2011-0137
Kansas City Power and Light – GMO	ER-2010-0356
Union Electric Company d/b/a AmerenUE	ER-2011-0028
Kansas City Power and Light – GMO	EO-2012-0119
Kansas City Power and Light Company	EO-2011-0137
Union Electric Company d/b/a AmerenUE	ER-2012-0121
Union Electric Company d/b/a/ Ameren Missouri	EX-2012-0332
Empire District Electric Company	EO-2011-0085
Empire District Electric Company	EO-2012-0192
Empire District Electric Company	EO-2013-0313
Union Electric Company d/b/a AmerenUE	ER-2012-0180

COMPANY	CASE NUMBER
Union Electric Company d/b/a AmerenUE	EO-2013-0418
City Utilities of Springfield	EO-2012-0441
Kansas City Power and Light – GMO	EO-2012-0367
Empire District Electric Company	ER-2011-0004
Union Electric Company d/b/a/ Ameren Missouri	ER-2012-0166
Kansas City Power and Light Company	ER-2012-0174
Union Electric Company d/b/a/ Ameren Missouri	ER-2013-0044
Kansas City Power and Light – GMO	ER-2012-0175
Central Missouri Electric Cooperative	EO-2015-0137
Empire District Electric Company	ER-2012-0345
Kansas City Power and Light Company	EO-2012-0367
Boone Electric Cooperative	EO-2015-0012
Transource Missouri, LLC	EA-2013-0098
Black River Electric Cooperative	EO-2015-0096
Union Electric Company d/b/a/ Ameren Missouri	EW-2012-0369
Empire District Electric Company	ER-2014-0351
Union Electric Company d/b/a/ Ameren Missouri	EO-2014-0044
Union Electric Company d/b/a/ Ameren Missouri	EO-2013-0418
Union Electric Company d/b/a/ Ameren Missouri	EE-2013-0511
Union Electric Company d/b/a/ Ameren Missouri	EO-2015-0017
Union Electric Company d/b/a/ Ameren Missouri	EO-2016-0087
Union Electric Company d/b/a/ Ameren Missouri	EO-2014-0009
Kansas City Power and Light Company	EO-2014-0128
Union Electric Company d/b/a/ Ameren Missouri	EO-2017-0358
Empire District Electric Company	EO-2016-0192
Empire District Electric Company	EO-2017-0217
Union Electric Company d/b/a/ Ameren Missouri	EO-2014-0296
Union Electric Company d/b/a/ Ameren Missouri	EO-2015-0328
Union Electric Company d/b/a/ Ameren Missouri	ER-2014-0258
Union Electric Company d/b/a/ Ameren Missouri	EX-2017-0153
Union Electric Company d/b/a/ Ameren Missouri	EO-2019-0391
Empire District Electric Company	EO-2018-0118
Empire District Electric Company	ER-2016-0023
Ozark Electric Cooperative Inc.	EO-2020-0163
Union Electric Company d/b/a/ Ameren Missouri	EC-2016-0235
Union Electric Company d/b/a/ Ameren Missouri	EO-2018-0058
Union Electric Company d/b/a/ Ameren Missouri	EE-2019-0395
Kansas City Power and Light – GMO	ER-2016-0156

COMPANY	CASE NUMBER
Kansas City Power and Light – GMO	EO-2019-0061
Kansas City Power and Light Company	ER-2014-0370
Union Electric Company d/b/a/ Ameren Missouri	EO-2017-0044
Kansas City Power and Light Company	ER-2016-0285
Empire District Electric Company	EO-2019-0381
Union Electric Company d/b/a/ Ameren Missouri	EE-2019-0395
Union Electric Company d/b/a/ Ameren Missouri	ER-2016-0179
Union Electric Company d/b/a/ Ameren Missouri	EO-2018-0278
Union Electric Company d/b/a/ Ameren Missouri	EO-2020-0315
Union Electric Company d/b/a/ Ameren Missouri	EO-2017-0127
Kansas City Power and Light Company	ER-2018-0145
Kansas City Power and Light Company – GMO	ER-2018-0146
Evergy Missouri West LLC	EO-2021-0388
Gridliance High Plains, LLC	EM-2022-0156
Union Electric Company d/b/a/ Ameren Missouri	EO-2021-0305
Union Electric Company d/b/a/ Ameren Missouri	EM-2021-0309
Union Electric Company d/b/a/ Ameren Missouri	ER-2019-0335
Union Electric Company d/b/a/ Ameren Missouri	EE-2019-0383
Osage Valley Electric Cooperative, LLC	EO-2022-0073
Osage Valley Electric Cooperative, LLC	EO-2023-0126
Ozark Border Electric Cooperative, LLC	EO-2022-0264
Evergy Missouri West LLC	EO-2021-0339
Union Electric Company d/b/a/ Ameren Missouri	EE-2021-0086
Union Electric Company d/b/a/ Ameren Missouri	EM-2022-0292
Liberty Utilities-Empire	EO-2021-0389
Laclede Electric Cooperative	EO-2022-0143
Empire District Electric Company	ER-2019-0374
Union Electric Company d/b/a/ Ameren Missouri	ET-2021-0082
Union Electric Company d/b/a/ Ameren Missouri	ER-2021-0240
Union Electric Company d/b/a/ Ameren Missouri	EO-2022-0226
Union Electric Company d/b/a/ Ameren Missouri	EO-2022-0190
Union Electric Company d/b/a/ Ameren Missouri	EO-2022-0332
Union Electric Company d/b/a/ Ameren Missouri	EO-2023-0256
NextEra Energy Transmission Southwest, LLC	EA-2022-0234
Evergy Missouri Metro	ER-2022-0129
Evergy Missouri West LLC	ER-2022-0130
Evergy Missouri West LLC	EO-2022-0320
Missouri Joint Municipal Utility Electric Commission	EM-2022-0156

COMPANY	CASE NUMBER
Liberty Utilities-Empire	EO-2022-0226
Liberty Utilities-Empire	EC-2022-0291
Union Electric Company d/b/a/ Ameren Missouri	EO-2021-0401
Union Electric Company d/b/a/ Ameren Missouri	EM-2022-0094
Union Electric Company d/b/a/ Ameren Missouri	EO-2022-0102
Union Electric Company d/b/a/ Ameren Missouri	ER-2022-0337
Liberty Utilities-Empire	EO-2022-0132
Liberty Utilities-Empire	ER-2021-0312
Union Electric Company d/b/a/ Ameren Missouri	EO-2024-0116
Liberty Utilities-Empire	EO-2024-0098
Union Electric Company d/b/a/ Ameren Missouri	EO-2024-0144
Evergy Missouri West LLC	EC-2024-0015
Osage Valley Electric Cooperative, LLC	EO-2023-0439
Howard Electric Cooperative	EO-2024-0247
Union Electric Company d/b/a/ Ameren Missouri	EO-2024-0208
Union Electric Company d/b/a/ Ameren Missouri	EX-2023-0254
Liberty Utilities-Empire	EO-2023-0266
Liberty Utilities-Empire	EO-2024-0165
Grain Belt Express LLC	EA-2023-0017
Liberty Utilities-Empire	EO-2023-0108
Liberty Utilities-Empire	EO-2024-0194
Invenergy	EC-2025-0136
Evergy Missouri West LLC	EC-2024-0168
Osage Valley Electric Cooperative, LLC	EO-2025-0031
Union Electric Company d/b/a/ Ameren Missouri	EO-2025-0092
Liberty Utilities-Empire	EO-2025-0253
Liberty Utilities-Empire	EO-2025-0228
Evergy Missouri West LLC	ER-2024-0189
Evergy Missouri Metro	EC-2025-0143
Union Electric Company d/b/a/ Ameren Missouri	EM-2025-0243
Union Electric Company d/b/a/ Ameren Missouri	ER-2024-0319

SCHEDULE AJB-d2

SUMMARY

RESULTS OF CALCULATIONS

SYSTEM ENERGY LINE LOSS FACTOR:

0.0676 of NSI

DEMAND ALLOCATION FACTORS:

Missouri Retail Jurisdiction:	0.8843
Kansas Retail Jurisdiction:	0.0436
Oklahoma Retail Jurisdiction	0.0379
Arkansas Retail Jurisdiction	0.0322
Missouri Wholesale Jurisdiction	0.0020
Total	1.0000

ENERGY ALLOCATION FACTORS:

Missouri Retail Jurisdiction:	0.8801
Non-Missouri Retail Jurisdiction[1]:	0.1178
Missouri Wholesale Jurisdiction	0.0022
Total:	1.0000

[1] Results for the individual Retail Jurisdictions of the States of Kansas, Oklahoma and Arkansas are summed and referenced as "Non-Missouri Retail".

VOLTAGE ADJUSTMENT FACTORS

$VAF_{Transmission}$ – 1.0376

$VAF_{Primary}$ – 1.0534

$VAF_{Secondary}$ – 1.0749