BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF MISSOURI

In the Matter of the 2025 Triennial Compliance Filing Pursuant to 20 CSR 4240-22 by The Empire District Electric Company d/b/a Liberty	)))	**File No. EO-2024-0280**

STAFF'S REPORT ON THE EMPIRE DISTRICT ELECTRIC COMPANY D/B/A LIBERTY'S 2025 TRIENNIAL COMPLIANCE FILING

COMES NOW the Staff of the Missouri Public Service Commission ("Staff"), by and through Staff Counsel's Office, and in response to The Empire District Electric Company d/b/a/ Liberty's ("Liberty") April 1, 2025, triennial compliance filing, submits the attached report of its limited review of that filing in accord with 20 CSR 4240-22.080(7).[1] In its report, Staff did not discover any deficiencies, but did identify two (2) concerns with Liberty's compliance filing, and suggests remedies for each.

WHEREFORE, Staff prays that the Commission accept its Report, and grant such other and further relief as is just in the circumstances.

Respectfully Submitted,

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[1] This rule requires Staff to file its report of its limited review within 150 days of when the compliance filing is made.

CERTIFICATE OF SERVICE

I certify that a copy of the foregoing was served via e-mail on counsel for the parties of record on this 29th day of August, 2025.

/s/ Tracy D. Johnson

MISSOURI PUBLIC SERVICE COMMISSION

STAFF REPORT ON

THE EMPIRE DISTRICT ELECTRIC COMPANY

ELECTRIC UTILITY RESOURCE PLANNING COMPLIANCE FILING

FILE NO. EO-2024-0280

Jefferson City, Missouri
August 29, 2025

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THE EMPIRE DISTRICT ELECTRIC COMPANY

FILE NO. EO-2024-0280

Executive Summary

On April 1, 2025, The Empire District Electric Company d/b/a Liberty ("Empire" or "Company"), filed its 2025 Integrated Resource Plan ("IRP") triennial compliance filing ("Filing") in Case No. EO-2024-0280, as required by 20 CSR 4240-22 Electric Utility Resource Planning. On May 30, 2024, the Missouri Public Service Commission ("Commission") issued its *Order Granting Variance.*[1]

Staff provides this Report as required by Commission Rule 20 CSR 4240-22.080(7):

> (7) The staff shall conduct a limited review of each triennial compliance filing required by this rule and shall file a report not later than one hundred fifty (150) days after each utility's scheduled triennial compliance filing date. The report shall identify any deficiencies[2] in the electric utility's compliance with the provisions of this chapter, any major deficiencies in the methodologies or analyses required to be performed by this chapter, and any other deficiencies and shall provide at least one (1) suggested remedy for each identified deficiency. Staff may also identify concerns[3] with the utility's triennial compliance filing, may identify concerns related to the substantive reasonableness of the preferred resource plan or resource acquisition strategy, and shall provide at least one (1) suggested remedy for each identified concern.

As a result of its limited review, and as more fully discussed throughout this Report, Staff identified two concerns regarding Empire's 2025 IRP Filing.

List of Staff's Identified Concerns

Concern A: The Realistic Achievable Potential ("RAP") level of Demand-Side Management ("DSM") savings in Empire's Preferred Resource Plan ("PRP") is inconsistent with the current level of DSM savings given that Empire does not currently offer DSM programs. To remedy this concern, Empire should update its Alternative Resource Plans ("ARPs") in its 2025 IRP Filing to remove DSM bundles from the plans to determine if Plan 4 is still appropriate as Empire's PRP.

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[1] Approved variance includes: 20 CSR 4240-22.030(4)(A)(1).

[2] 20 CSR4240-22.020(9) Deficiency means deficiencies in the electric utility's compliance with the provisions of this chapter, any major deficiencies in the methodologies or analyses required to be performed by this chapter, and anything that would cause the electric utility's resource acquisition strategy to fail to meet the requirements identified in Chapter 22.

[3] 20 CSR 4240-22.020(6) Concern means concerns with the electric utility's compliance with the provisions of this chapter, any major concerns with the methodologies or analyses required to be performed by this chapter, and anything that, while not rising to the level of a deficiency, may prevent the electric utility's resource acquisition strategy from effectively fulfilling the objectives of Chapter 22.

Concern B: The enactment of the One Big Beautiful Bill ("OBBB") on July 4, 2025, significantly altered the tax landscape. Staff's understanding of the OBBB is that investment tax credits ("ITC") and production tax credits ("PTC") will no longer be available for wind and solar projects that are placed in service after December 31, 2027. However, a special transition rule provides that wind and solar projects that begin construction within one year of the OBBB enactment will still qualify for the ITC or PTC, even if placed in service after 2027.[4] Empire's PRP includes 175 MW solar development being targeted to commission in 2028, however Empire is not certain that this project will proceed. The OBBB could greatly influence whether Empire moves forward with this solar project. Empire has a contingency plan in place from this IRP in case the solar project does not materialize. However, in its PRP, Empire has included 150 MW of utility-scale solar in years 2035 and 2041. Since the OBBB was enacted after Empire filed its 2025 IRP, to remedy this concern, Empire should update its ARPs to remove any tax credits for solar and wind projects placed in service after December 31, 2027.

20 CSR 4240-22.010 Policy Objectives

20 CSR 4240-22.010 Policy Objectives, has a stated purpose that "This rule states the public policy goal that this chapter is designed to achieve and identifies the objectives that the electric utility resource planning process must serve."

20 CSR 4240-22.010(1) and (2) state:

> (1) The commission's policy goal in promulgating this chapter is to set minimum standards to govern the scope and objectives of the resource planning process that is required of electric utilities subject to its jurisdiction in order to ensure that the public interest is adequately served. Compliance with these rules shall not be construed to result in commission approval of the utility's resource plans, resource acquisition strategies, or investment decisions.
>
> (2) The fundamental objective of the resource planning process at electric utilities shall be to provide the public with energy services that are safe, reliable, and efficient, at just and reasonable rates, in compliance with all legal mandates, and in a manner that serves the public interest and is consistent with state energy and environment policies The fundamental objective requires that the utility shall —

[4] Timing energy tax credits after the One, Big, Beautiful Bill | Our Insights | Plante Moran

> (A) Consider and analyze demand-side resources, renewable energy, and supply-side resources on an equivalent basis, subject to compliance with all legal mandates that may affect the selection of utility electric energy resources, in the resource planning process;

Staff performed its review of Empire's 2025 IRP Filing using the Commission's policy goal in promulgating this Chapter and the fundamental objective of the resource planning process as the foundation of its review. Based on its limited review, Staff concludes Empire's 2025 IRP Filing meets the requirements of rule 20 CSR 4240-22.010.

Staff Expert Witness: Brad J. Fortson

20 CSR 4240-22.030 Load Analysis and Forecasting

Summary

20 CSR 4240-22.030, Load Analysis and Load Forecasting, has a stated purpose of setting:

> . . . minimum standards for the maintenance and updating of historical data, the level of detail required in analyzing loads, and the purposes to be accomplished by load analysis and by load forecast models. The load analysis discussed in this rule is intended to support both demand-side management efforts of 20 CSR 4240-22.050 and the load forecast models of this rule. This rule also sets the minimum standards for the documentation of the inputs, components, and methods used to derive the load forecasts.

Thorough analysis and forecasting of electricity demand enable utilities to accurately predict future electricity consumption, strategically plan the purchase and generation of electric power, renewable energy integration, and infrastructure development, thereby, optimizing operational efficiency, preventing shortages or excess capacity, minimizing costs, and ensuring grid stability. Load analysis and forecasting also empowers utilities to optimize resource management through demand response programs, encouraging energy conservation during peak periods, and promoting efficient utilization of resources.

Subsection 22.030(1) requires the utility to "describe and document its intended purposes for load analysis methods, why the selected load analysis methods best fulfill those purposes, and how the load analysis methods are consistent with one another and with the end-use consumption data used in the demand-side analysis as described in 20

CSR 4240-22.050." This rule allows utilities to use various analytical methods at their discretion to perform load analysis and develop forecasts, ensuring they can achieve the rule's stated purpose.

Empire developed its 2025 IRP load forecast using three modeling processes. The first, the sales model uses Itron's Statistically Adjusted End-Use ("SAE") method for the residential and commercial classes, and traditional econometric methods for the remaining classes. The SAE model includes annual end-use drivers obtained from Itron based on the Energy Information Administration's ("EIA") 2023 Annual Energy Outlook ("AEO"). These data capture changing end-use saturation and energy efficiency trends for each census region based on adopted energy efficiency codes and standards. The sales model has three key inputs: historical data, weather and economics. Empire provided the historical data. The hourly weather data from January 1, 1981, through April 30, 2024, are derived from the National Oceanic and Atmospheric Administration ("NOAA") data for Springfield, Missouri and the economic data are purchased from Woods and Poole, Inc. The second, the peak model is an econometric model that forecasts monthly gross system peaks based on historical monthly peak day events from January 2013 through April 2024 with weather and energy growth serving as the primary drivers. The weather data are derived from the historical weather conditions on past monthly peak days and the energy growth is derived from the sales model. By using the sales models, the peak model implicitly incorporates the impact of the changing end-uses embedded in the residential, small commercial, and large commercial models. The weather data are included in the sales and peak models to capture the weather sensitivity of electric consumption. Lastly, the hourly load model, forecasts system hourly load by aggregating hourly class forecasts and calibrating them to the peak model result. The key components in the hourly load model are the hourly class models, the normal daily weather, and the behind the meter photovoltaic ("PV") and electric vehicles ("EV") forecasts.

Empire developed several scenarios in its load forecast: two economic scenarios; the high and low economic forecast, to construct planning bounds around the base forecast, two weather scenarios; the mild and extreme weather scenarios to capture the uncertainty associated with weather conditions. In addition to the four scenarios above, an additional scenario is created for this forecast. The scenario combines the high economic scenario with a high electric vehicle forecast and is named the "high-high" scenario.

The result from the base forecast for total system energy indicate that demand is expected to remain relatively stable over the 30- year period. Both summer and winter peaks (net system peaks) move consistently with the system forecast, showing only slight increases over time, reflecting a conservative outlook. The scenario forecasts including the extreme, mild, high, and low scenario, create upper and lower bounds around the base case that capture demand risk. For instance, under the high economic forecast, total system energy sees a modest increase, reflecting steady economic activity and gradual electrification. The most substantial growth is projected under the high-high scenario. This scenario establishes a new upper bound for energy demand, driven primarily by the increased electricity needed for a growing number of electric vehicles. However, while the high-high scenario projects the most significant increase in system energy demand, this growth remains relatively low.

The residential sales class is modeled using two components: a customer model and an average use-per-customer ("UPC") model. The residential customer model employs time series regression analysis to estimate the number of residential customers over time. The result show that the Household Index, which reflects the household forecast for the Springfield and Joplin metropolitan statistical areas ("MSAs") is the strongest and most statistically significant predictor for the number of residential customers. This suggests that the number of residential customers grows in proportion to projected household growth in the region. The UPC model is an SAE model that contains end-use information for heating, cooling, and base load technologies from Itron's 2023 SAE West North Central region. The data used in the model include end use efficiencies, end use saturations and intensities, economic data and energy prices. The model results indicate that heating, cooling, and other end-use categories are key drivers of residential energy consumption. For instance, the coefficients for both heating and cooling imply that a 1 unit increase in either result in a 1.103 unit increase in energy use per residential customer. Additionally, the coefficient for the historical impact of behind-the-meter solar installations based on Empire's solar rebate program on use per customer is negative and statistically significant indicating that higher residential solar adoption reduces use per customer, likely due to self-generation. Based on the model results, the residential sales forecast is developed by multiplying the customer and UPC forecasts, and then adjusted for growth in electric vehicles and behind-the-meter solar installations. The forecast projects moderate average annual growth in sales and customer numbers from 2025 to 2054. These low

growth residential sales growth rates are indicative of slow population growth within the Company's service territory, energy efficiency improvements, and the penetration of behind the meter solar.

The small commercial sales class is modeled using two components: a customer model and an average UPC model. The small commercial customer model employs time series regression analysis to estimate the number of small commercial customers over time. The result show that the Total Employment Index, which reflects the historical and forecast employment forecast for the Springfield and Joplin MSAs is the strongest and most statistically significant predictor for the number of small commercial customers. This implies that the number of small commercial customers grows in proportion to projected employment growth in the region. The UPC model is an SAE model that contains end-use information for heating, cooling, and base load technologies from Itron's 2023 SAE West North Central region. The data used in the model include end use saturations and efficiencies, economic data and energy prices. The model results indicate that heating, cooling, and behind the meter solar are the key drivers of small commercial energy consumption with the heating variable having a higher effect than the cooling variable. For example, the coefficients for heating imply that a 1 unit increase in heating result in a 0.911 unit increase in energy use per customer. Additionally, the coefficient for the historical impact of behind-the-meter solar installations based on Empire's solar rebate program on use per customer is negative and statistically significant indicating that higher small commercial solar adoption reduces average use per customer. Based on the model results, the small commercial sales forecast is developed by multiplying the customer and UPC forecasts to obtain the total sales each month, then adjusting for growth in electric vehicles and behind-the-meter solar installations. The result from the forecast reveals a minimal average annual growth in sales and customer numbers from 2025 to 2054. This flat sales growth reflects the slow pace of small commercial customer growth within the Company's service territory.

The large commercial sales class is modeled using two components: a customer model and an average UPC model. The large commercial customer model employs time series regression analysis to estimate the number of large commercial customers over time. The result show that the Total Employment Index, which reflects the historical and forecast employment forecast for the Springfield and Joplin MSAs is the strongest and most statistically

significant predictor for the number of large commercial customers. This implies that the number of large commercial customers grows in proportion to projected employment growth in the region. The UPC model is an SAE model that contains end-use information for heating, cooling, and base load technologies from Itron's 2023 SAE West North Central region. The data used in the model include end use saturations and efficiencies, economic data and energy prices. The model results indicate that heating and cooling variables are the key predictors of large commercial energy consumption with the cooling variable having a higher effect than the heating variable. For instance, the coefficients for cooling indicate that a 1 unit increase in cooling, result in an 11.573 unit increase in energy use per large commercial customer. This suggests that large commercial customer buildings generate significant internal heat from equipment, lighting, and high occupancy, which makes cooling more important to maintain comfortable temperatures year-round. Additionally, the coefficient for the historical impact of behind-the-meter solar installations based on Empire's solar rebate program on use per large commercial customer is negative but not statistically significant. This could be due to the fact that their total energy consumption is so high that rooftop solar offsets only a small fraction of it. Based on the model results, the large commercial sales forecast is developed as the product of the customer and UPC forecasts and then adjusted for growth in electric vehicles and behind-the-meter solar installations. The result from the forecast reveals a slow average annual growth in sales and customer numbers from 2025 to 2054. This pessimistic growth reflects the stagnant pace of large commercial customer growth within the Company's service territory.

The industrial sales class is modeled using two components: a customer count forecast and an average UPC model. For the customer count forecast, the class grew from 38 customers in January 2012 to 44 customers by March 2024. In April 2024, one customer was removed from the forecast. From May to December 2024, seven new customers are added, resulting in an increase in peak demand of 8.2 MW. The low number of customers and slow growth could not be reliably forecasted using a statistical model. Instead, the industrial customer forecast is based on known customer expansions and projects. The existing 44 customer energy usage is modeled with a UPC model which forecasts constant usage based on recent usage patterns after accounting for the effect of COVID and data outliers. Based on the model results, the industrial sales forecast is developed as the product of the customer and UPC forecasts to obtain the total

sales in each month. The result from the forecast reveals a zero average annual growth in sales and customer numbers from 2025 to 2054 implying a no growth forecast within the Company's service territory.

Staff would also like to note that on October 23, 2024, in Case No. EO-2025-0079, the Commission issued its *Order Establishing Special Contemporary Resource Planning Issues* ("SCI Order"). In its SCI Order, the Commission established 9 SCIs for Empire to analyze and document in its 2025 IRP Filing. One of the SCIs in particular was for Empire to "Model large load growth scenarios stemming from: 1) data centers with a demand of 30 megawatts or greater; 2) potential re-shoring of industries, specifically manufacturing or materials refinement; and 3) electrification of buildings and vehicles as a result of federal mandates changes in the marketplace, or evolving consumer preference." Staff will focus on the data center modeling portion of this SCI. Empire did not add any new data centers in its base case. Only additions with a high probability of occurrence are included in the forecast, and no data center inquiries met this requirement. The data center scenario represents a hypothetical new large data center customer with a 30 MW peak and 90% load factor, added in 2030. The following table shows the data center scenarios' annual energy, summer peak, and winter peaks compared to the base case for selected years:

Year	Base Energy (MWh)	Scenario Energy (MWh)	Base Summer Peak (MW)	Scenario Summer Peak (MW)	Base Winter Peak (MW)	Scenario Winter Peak (MW)
2012^	4,896,614		1,078		906	
2015^	4,971,141		1,036		1,096	
2020^	4,886,351		994		982	
2023^	5,070,124		1,120		941	
2025	5,233,509	5,233,509	1,123	1,123	1,176	1,176
2030	5,170,878	5,423,706	1,111	1,141	1,178	1,208
2035	5,208,619	5,461,446	1,128	1,157	1,200	1,230
2040	5,273,710	5,527,230	1,153	1,182	1,222	1,252
2045	5,336,034	5,588,861	1,180	1,209	1,245	1,275
2050	5,437,934	5,690,761	1,216	1,245	1,272	1,302

^Historical data excludes municipals (Monett, Mount Vernon, and Chetopa)

In conclusion, Empire's 2025 IRP load forecast indicates a notably pessimistic outlook with minimal to no projected growth across the customer classes over the forecast period. This forecast likely reflects underlying assumptions of slow growth in key demand drivers such as population and total employment and also energy efficiency improvements and increase in behind-the-meter solar adoption. Staff has not identified any deficiencies based on its limited review of Empire's load analysis and energy and demand forecasts. While the

accuracy of the information provided cannot be definitively confirmed, there is no indication of any shortcomings at this time. Based on its limited review, Staff concludes that the 2025 IRP Filing meets the Load Analysis and Load Forecasting requirements of 20 CSR 4240-22.030.

Staff Expert Witness: Obianuju Ezenwanne and Brad J. Fortson

20 CSR 4240-22.040 Supply-Side Resource Analysis

Summary

Rule 4 CSR 240-22.040 Supply-Side Resource Analysis requires Empire to review existing resources for opportunities to upgrade or retire existing resources and also review a wide variety of supply-side resources options to determine cost estimates for each type of resource.

Resource options are to be ranked based upon their relative levelized annual costs, including installed capital costs, fixed and variable operation and maintenance costs, and probable environmental costs levelized over the useful life of the potential supply-side resource options using the utility discount rate. Resources which do not have significant disadvantages pass this pre-screening process and are to be included in the integrated resource analysis process used to select a preferred resource plan.

Liberty-Empire, following 20 CSR 4240-22.040(1) and (2), undertook a structured process to evaluate potential supply-side resource options for its future energy portfolio. The process began with a comprehensive list of possible resources, including current, new, and emerging generation technologies, distributed resources, resource upgrades, and purchased power options.

The company then used a feasibility screening process to narrow the list to those options likely viable within its service territory. For the remaining feasible options, planning-level cost and operational assumptions were developed by Liberty-Empire's IRP consultant, Charles River Associates ("CRA"), with review and input from engineering experts at Black & Veatch.

A market scan approach was used to establish cost and performance parameters. These were used to calculate the levelized cost of electricity ("LCOE") and capacity, enabling

Liberty-Empire to assess commercial viability. Resource options deemed commercially unviable compared to others were removed.

Finally, incorporating both screening results and probable environmental costs, Liberty-Empire identified a "shortlist" of supply-side resource options to be further evaluated in its integrated resource planning analysis (detailed in Volume 6). Based on its limited review, Staff concludes that the 2025 IRP Filing meets the requirements of Supply-Side Resource Analysis 20 CSR 4240-22.040.

Staff Expert Witness: Jordan T. Hull

20 CSR 4240-22.045 Transmission and Distribution Analysis

Summary

Rule 20 CSR 4240-22.045 Transmission and Distribution Analysis specifies minimum standards for the scope and level of detail required for transmission and distribution network analysis and reporting. Rule 20 CSR 4240-22.045 does not prescribe how analyses are to be done, but rather allows a utility to conduct its own analysis or adopt the regional transmission operator ("RTO") or Independent Transmission System Operator ("ISO") transmission plans. Rule 20 CSR 4240-22.045 requires analysis and documentation of the RTO/ISO transmission projects and requires the electric utility to review transmission and distribution for the reduction of power losses, interconnection of new generation facilities, facilitation of sales and purchases, and incorporation of advance technologies for the optimization of investment in transmission and distribution resources.

Staff has not identified any deficiencies or concerns related to Empire's transmission and distribution analysis in the 2025 IRP filing.

Staff Expert Witness: Jordan T. Hull

20 CSR 4240-22.050 Demand-Side Resource Analysis

Summary

Rule 20 CSR 4240-22.050, Demand-Side Resource Analysis, "specifies the principles by which potential demand-side resource options shall be developed and analyzed for cost-effectiveness, with the goal of achieving all cost-effective demand-side savings." The rule identifies the objectives to be achieved by the demand-side programs and portfolios,

and gives each utility the option of developing demand-side programs or portfolios from the top down (starting with program designs and filling in the cost-effective measures) or from the bottom up (starting with screening a comprehensive menu of measures and ending with program designs). The rule clarifies the distinction between demand-side programs and demand-side rates. The rule includes the calculation of the Total Resource Cost ("TRC") test, which meets the requirement of the Missouri Energy Efficiency Investment Act ("MEEIA"). The rule requires documentation regarding how the potential demand-side resources were analyzed and screened to identify demand-side candidate resource options to advance to the integrated resource analysis. Finally, Rule 20 CSR 4240-22.050 requires the assessment of technical potentials,[5] maximum achievable potentials ("MAP"),[6] and realistic achievable potentials ("RAP")[7] and the selection of demand-side candidate resource options that are passed on to integrated resource analysis in Rule 20 CSR 4240-22.060.

Empire engaged Applied Energy Group ("AEG") to conduct a Demand-Side Management ("DSM") market potential study ("MPS") to assess the future potential for energy and demand savings. AEG developed IRP bundles using a bottom-up approach incorporating measure and participation data from the DSM MPS. Measures deemed cost-effective in the DSM MPS were included in the economic and achievable potential. The DSM MPS measure-level MAP and RAP results were vetted for inclusion in a DSM bundle and added to bundles as they became cost-effective throughout the timeframe. Measures were bundled based on the end-use, sector, and implementation strategy. Incentive and non-incentive costs were assigned to bundles, and bundles were rescreened for cost-effectiveness. The proposed bundles for inclusion in the 2025 IRP in both the RAP and MAP scenarios included Residential Prescriptive, Income Eligible Lighting, Commercial Prescriptive, Commercial Custom, Small Business Direct Install, and Demand Response.

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[5] Technical Potential is defined as the theoretical upper limit of conservation potential. It assumes that customers adopt all feasible measures regardless of their cost. At the time of existing equipment failure, customers replace their equipment with the most efficient option available. In new construction, customers and developers also choose the most efficient equipment option.

[6] MAP refines economic potential by applying customer participation rates that account for market barriers, customer awareness and attitudes, program maturity, and other factors that affect market penetration of efficiency measures. It is the maximum amount of savings that can be realized under ideal market, implementation, and customer preference conditions.

[7] RAP further refines achievable potential to reflect expected program participation given barriers to customer acceptance, non-ideal implementation conditions, and limited program budgets. This represents a lower bound on achievable potential.

As will be discussed further in the Integrated Resource Plan and Risk Analysis section of this report, Empire developed twelve alternative resource plans ("ARP") for purposes of the 2025 IRP analysis. To further develop an ARP that is also minimally compliant with legal mandates for demand-side resources, as 20 CSR 4240-22.050 requires, Empire developed Plan 1A which does not allow any new DSM resources. Given that at least some level of new DSM resources was deemed to be cost-effective in all plans, Plan 1A was analyzed primarily for compliance purposes and only under base planning assumptions. Aside from Plan 1A, the twelve plans previously mentioned that were developed for purposes of the 2025 IRP analysis included DSM (9 included RAP level DSM savings and 3 included MAP level DSM savings). As will also be further discussed in the Integrated Resource Plan and Risk Analysis section of this report, the Company chose Plan 4 as its preferred resource plan ("PRP"). Plan 4 includes RAP level DSM savings.

Empire began offering DSM programs under the regulatory framework prescribed by MEEIA in January 2022. Empire's MEEIA Cycle 1 was initially approved to run for one year through December 31, 2022. However, the Commission ultimately approved two subsequent one-year extensions through December 31, 2024. The Commission then approved an extension of MEEIA Cycle 1 through March 31, 2025, to allow Empire and stakeholders to work on a MEEIA Cycle 2 application or settlement. On March 10, 2025, Empire and its stakeholders filed a *Global Stipulation and Agreement* ("Agreement") requesting the Commission to approve Empire's MEEIA Cycle 2 to begin on April 1, 2025. On March 26, 2025, the Commission issued its *Order Suspending Tariff and Authorizing the Parties to File a Proposed Procedural Schedule* ("MEEIA Cycle 2 Order"). In its MEEIA Cycle 2 Order, the Commission did not find it appropriate to approve the Agreement at that time, and suspended Empire's proposed MEEIA Cycle 2 tariff sheets and authorized the parties to file a proposed procedural schedule if they wished to proceed with a MEEIA Cycle 2. On April 10, 2025, Empire filed its *Notice of Dismissal* withdrawing its MEEIA Cycle 2 application.

Empire does not currently offer DSM programs.[8] As of the date of the filing of this Staff Report, no DSM programs have been proposed for approval. In its 2025 IRP Filing, Empire has chosen Plan 4 as its PRP. Plan 4 includes RAP level DSM savings. Therefore, Empire's PRP is inconsistent with current DSM offerings.

Concern A – The RAP level of DSM savings in Empire's PRP is inconsistent with the current level of DSM savings given that Empire does not currently offer DSM programs. To remedy this concern, Empire should update its ARPs to remove DSM bundles from the plans to determine if Plan 4 is still appropriate as Empire's PRP.

Staff Expert Witnesses: Brad J. Fortson

20 CSR 4240-22.060 Integrated Resource Plan and Risk Analysis

Summary

This rule requires the utility to design alternative resource plans ("ARPs") to meet the planning objectives identified in Rule 20 CSR 4240-22.010(2), and sets minimum standards for the scope and level of detail required in resource plan analysis and for the logically consistent and economically equivalent analysis of alternative resource plans. The utility is to identify the critical uncertain factors that affect the performance of alternative resource plans and establishes minimum standards for the methods used to assess the risks associated with these uncertainties.

The goal is to develop a set of ARPs based on substantively different mixes of supply-side resources and demand-side resources and variations in the timing of resource acquisition to assess their relative performance under expected future conditions as well as their robustness under a broad range of future conditions.

Empire developed twelve ARPs for purposes of the 2025 IRP analysis.[9] Eight of the twelve ARPs assumed "baseline," or age-based, retirement dates and expected Purchased Power Agreement expirations for the existing resources in Empire's generation portfolio.

[8] Empire offers its Weatherization Program which is designed to provide energy education and weatherization assistance, primarily to lower income customers. This Program is intended to assist customers through conservation, education, and weatherization in reducing their use of energy and to reduce the level of bad debts experienced by Empire.

[9] To further develop an ARP that is also minimally compliant with legal mandates for demand-side resources, as 20 CSR 4240-22.050 requires, Empire developed Plan 1A witch does not allow any new DSM resources. Given that at least some level of new DSM resources was deemed to be cost-effective in all plans, Plan 1A was analyzed primarily for compliance purposes and only under base planning assumptions.

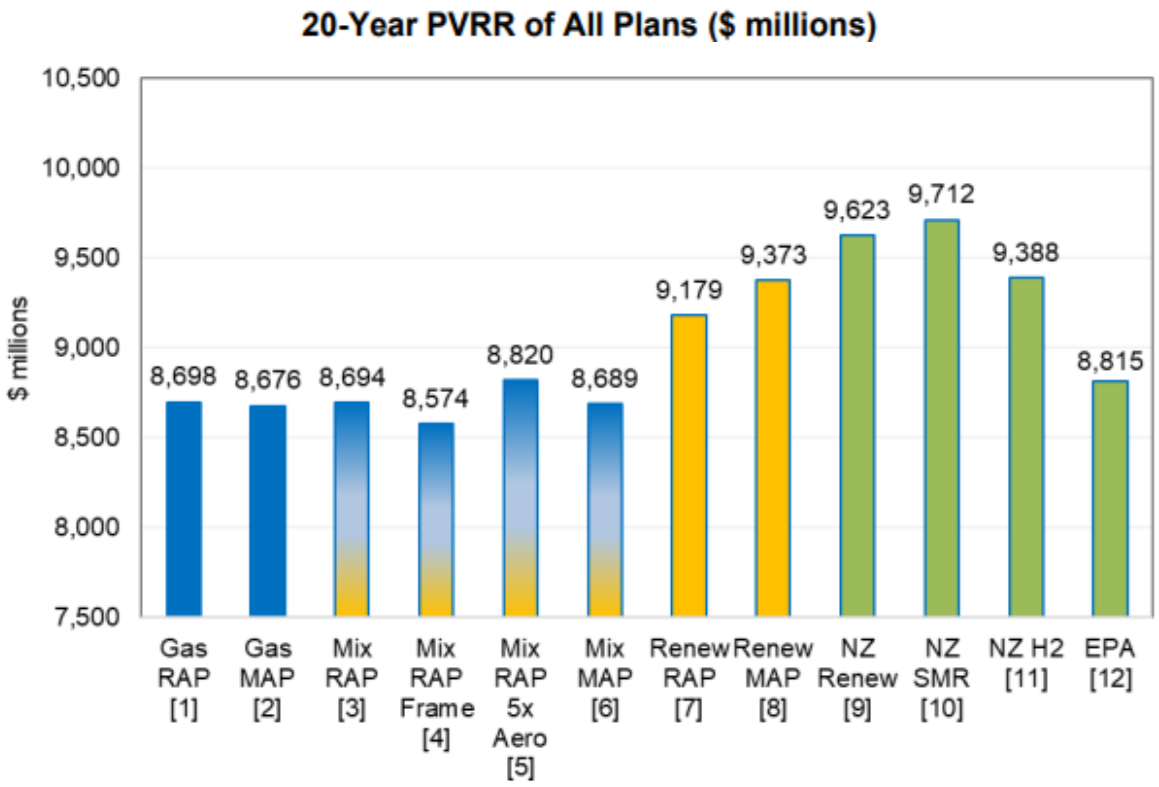
The remaining four of the twelve ARPs were intended to examine the feasibility and tradeoffs of achieving the hypothetical long-term net zero carbon emissions by 2050 and to examine compliance with the U.S. Environmental Protection Agency ("EPA") Greenhouse Gas ("GHG") Rule. To address the adequacy gap resulting from the assumed retirements of existing resources and load growth, each resource portfolio was subject to constraints on resource acquisition strategy. These constraints defined the type of resources that could be added to the portfolio over the IRP planning horizon. The "baseline" portfolios included a subset of plans that allowed the addition of only thermal resources versus only renewable and storage resources and a subset of plans that allowed the addition of RAP DSM versus MAP DSM programs. For the "net zero" portfolios, the existing natural gas-fired combined cycles were assumed to be replaced by a combination of renewables and emerging technologies such as advanced storage, nuclear small modular reactors ("SMR") and/or hydrogen. A summary of the twelve ARPs is in the following table:

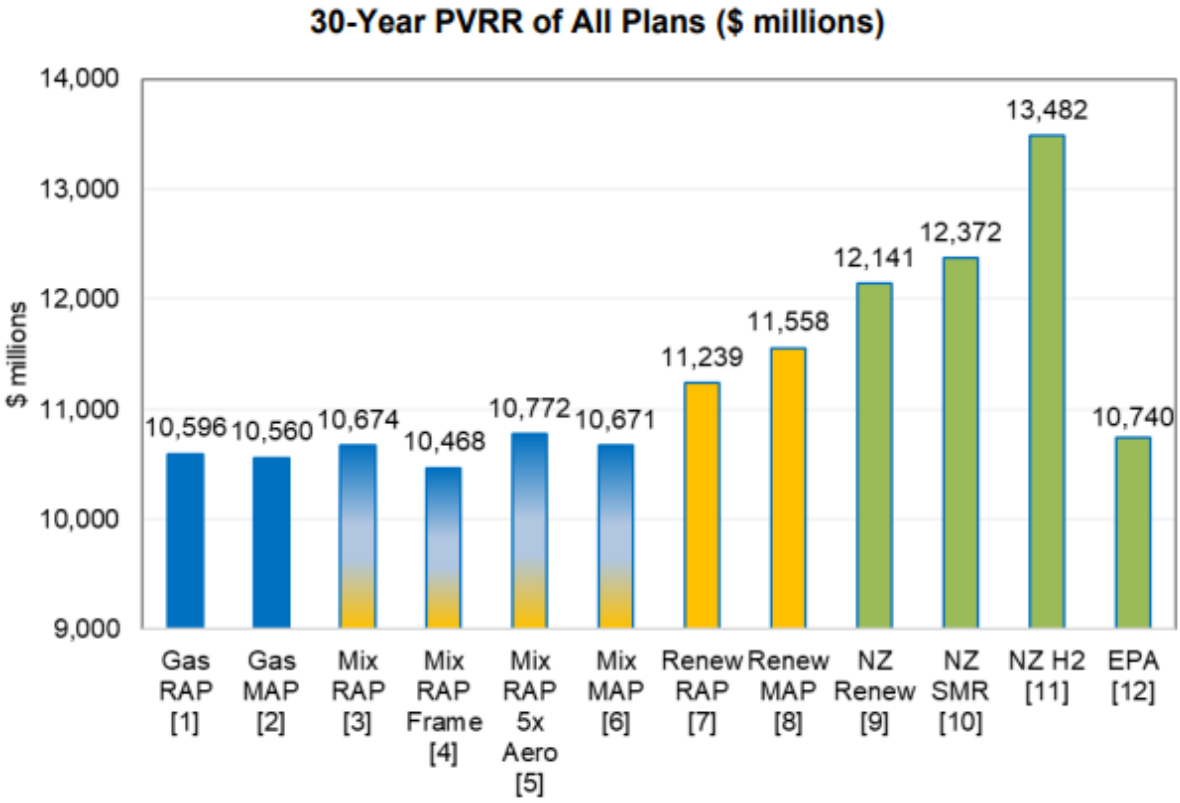
Plan	Plan Description	Replacement Tech.	Key Retirements*	DSM Bundle
1	Gas Only – Utility-Scale + Distributed	Natural Gas		RAP
2	Gas Only – Utility-Scale + Distributed	Natural Gas		MAP
3	Gas/Renew Mix – Utility-Scale + Distributed	Natural Gas + Renew.		RAP
4	Gas/Renew Mix – Utility-Scale + Distributed + Frame CT (2029)	Natural Gas + Renew.		RAP
5	Gas/Renew Mix – Utility-Scale + Distributed + 5x Aero (2029)	Natural Gas + Renew.		RAP
6	Gas/Renew Mix – Utility-Scale + Distributed	Natural Gas + Renew.		MAP
7	Renewable – Utility-Scale + Distributed	Renewable		RAP
8	Renewable – Utility-Scale + Distributed	Renewable		MAP
9	Net Zero 2050 – Renewable + Storage	Renewable	Riverton CC 2045 Stateline CC 2050	RAP
10	Net Zero 2050 – Nuclear SMR	Nuclear + Re-newable	Riverton CC 2045 Stateline CC 2050	RAP
11	Net Zero 2050 – Hydrogen	Hydrogen + Re-newable	Riverton CC 2045 Stateline CC 2050	RAP
12	EPA GHG Rule – Advanced Tech	Advanced Tech. + Renew.	Iatan 1 2031 Iatan 2 2031 Plum Point 2031	RAP

DSM = "Demand-Side Management"
RAP = "Realistic Achievable Potential"
MAP = "Maximum Achievable Potential"
Renewable options include storage. Advanced storage options are allowed only in the net zero portfolios.

*Incremental to retirements and PPA expirations that are common across all plans:
Expiration of the Elk River Wind PPA in 2025
Expiration of the 78 MW MJMEUC Capacity Sale PPA in 2025
Retirement of Riverton 10 and 11 in 2026
Expiration of the 25 MW MJMEUC Capacity Sale PPA in 2027
Expiration of the Meridian Way Wind PPA in 2028
Retirement of Energy Center 1 and 2 by 2035
Retirement of Iatan 1 in 2039
Expiration of the Plum Point PPA in 2040

In addition to present value of revenue requirements ("PVRRs") calculated for the 20-year planning horizon (2025-2044) required for the IRP analysis, Empire also calculated PVRRs for the 30-year planning horizon to compare plans that add significant amounts of capital and fixed costs in the longer term. The difference between the 20-year and 30-year PVRRs does not materially change the ordering of the plans. The PVRR for each of Empire's twelve ARPs over the 20-year and 30-year planning horizons are shown in the following figures:


20-Year PVRR of All Plans ($ millions)
$ millions
10,500
10,000
9,500
9,000
8,500
8,000
7,500
8,698
8,676
8,694
8,574
8,820
8,689
9,179
9,373
9,623
9,712
9,388
8,815
Gas RAP [1]
Gas MAP [2]
Mix RAP [3]
Mix RAP Frame [4]
Mix RAP 5x Aero [5]
Mix MAP [6]
Renew RAP [7]
Renew MAP [8]
NZ Renew [9]
NZ SMR [10]
NZ H2 [11]
EPA [12]


30-Year PVRR of All Plans ($ millions)
$ millions
14,000
13,000
12,000
11,000
10,000
9,000
10,596
10,560
10,674
10,468
10,772
10,671
11,239
11,558
12,141
12,372
13,482
10,740
Gas RAP [1]
Gas MAP [2]
Mix RAP [3]
Mix RAP Frame [4]
Mix RAP 5x Aero [5]
Mix MAP [6]
Renew RAP [7]
Renew MAP [8]
NZ Renew [9]
NZ SMR [10]
NZ H2 [11]
EPA [12]

Pursuant to 20 CSR 4240-22.060(5), Empire developed a list of potential uncertain factors to use to evaluate the resilience to risk of ARPs. Empire tested the impact of changing one uncertain factor at a time on the PVRR rankings of a subset of thematically distinct replacement portfolios to determine whether an uncertain factor was critical. If the average PVRR values across the portfolios changed by more than 1% relative to the rankings under the base case because of the impact of a given uncertain factor, then that uncertain factor was deemed "critical." Some of the uncertain factors were grouped into a single uncertain factor to simplify the analysis. The following single uncertain factors were determined to be critical uncertain factors (the footnotes show what uncertain factors were grouped into the single uncertain factor): Load,[10] Cost of New Builds,[11] Emissions,[12] Natural Gas Price, and Power / A/S / ELCC[13] (dependent on Emissions and NG Prices).

Based on its limited review, Staff has not identified any deficiencies or concerns related to Empire's 2025 IRP Filing and 20 CSR 4240-22.060.

Staff Expert Witness: Brad J. Fortson

20 CSR 4240-22.070 Resource Acquisition Strategy Selection

Summary

This rule requires the utility to select a preferred resource plan, develop an implementation plan, and officially adopt a resource acquisition strategy. The rule also requires the utility to prepare contingency plans and evaluate the demand-side resources that are included in the resource acquisition strategy.

20 CSR 4240-22.070(2) requires the Company to specify the ranges or combinations of outcomes for the critical uncertain factors that define the limits within which the preferred resource plan is judged to be appropriate and explain how these limits were determined. A critical uncertain factor is any uncertain factor that is likely to materially affect the outcome of the resource planning decision. As mentioned in the prior section, Empire identified the critical uncertain factors that can be grouped into the following: load growth, carbon prices,

[10] Includes Load and Planning Reserve Margin.
[11] Includes Capital Cost Trajectories, Interest Rates, Interconnection Costs, and Tax Credits.
[12] Includes Carbon Prices, SO2, and NOx.
[13] Includes Power/Capacity Prices, Solar and Storage Effective Load Carrying Capability, and Ancillary Service Value.

cost of new builds, and natural gas prices. As mentioned above, and illustrated in the summary of ARPs table above, Empire developed 12 ARPs. Of the baseline plans (Plans 1 – 8), Empire found that the Gas-Renewable Mix portfolios (Plans 3 – 6) performed the best across most combinations of natural gas price, emissions cost, and load conditions. The gas-only portfolios (Plans 1 – 2) performed best under certain scenarios with high cost of new build trajectories. Under the high cost of new build scenarios, Plans 7 – 8 were higher cost due to higher assumed solar and storage capital costs, less favorable future federal tax credit policy, higher interconnection costs, and higher interest rates. However, the high cost of new builds endpoint represents a "worst case scenario" for all component variables, and Empire believes it is unlikely that all of the factors within the high cost of new build critical uncertain factor would happen simultaneously for a sustained period of time. No combination of natural gas price, emissions price, and load growth was found to change the positioning of the Gas Only or Gas-Renewable Mix portfolios as the best-performing plans. Empire found that a preferred plan strategy that includes at least some natural gas generation is expected to perform better than any alternative strategies regardless of how natural gas prices, emissions prices, and load growth are reasonably expected to evolve. When further evaluating the performance of the Gas-Renewable Mix plans (Plans 3 – 6) under the critical uncertain factor scenarios, Empire determined that Plan 4 (Mixed Gas/Renew Mix + RAP DSM + Frame CT) had a lower cost across all scenarios. This is primarily due to relatively lower capital and fixed operating costs of gas frame units.

Empire's decision-makers selected Plan 4 as its Preferred Resource Plan ("PRP"). The PRP includes the following assumed supply side resource retirements and additions:

Preferred Plan Supply Side Resource Retirements and Additions

Year	Supply-Side Retirements and PPA Expirations	Supply-Side Additions
2025	Elk River Contract Expires (150 MW)	
2026	Riverton 10-11 Retires (27 MW)	
2027		RAP DSM (Low-, Mid-, and High-Cost Bundles)
2028	Meridian Way Contract Expires (105 MW)	
2029		Gas Frame CT (240 MW)
2030		
2031		
2032		
2033		
2034		
2035	Energy Center 1 and 2 Expires (160 MW)	Utility-Scale Solar (150 MW)
2036		Gas Frame CT (240 MW)
2037		
2038		
2039	Iatan 1 Retires (84 MW)	
2040	Plum Point PPA Expires (50 MW)	
2041		Utility-Scale Solar (150 MW); Dist. RICE (2 MW)
2042		Dist. RICE (8 MW)
2043		Dist. RICE (8 MW); Dist. Storage (1 MW)
2044		Dist. RICE (10 MW)

Note – In addition to the resources above, the plan includes near-term firm additions established as a part of previous planning (27 MW gas CT at Riverton site in 2026, 175 MW solar in 2028)

Empire considers Plans 1, 3, 5, and 12 contingency plans to the PRP. Plan 1 represents a contingency plan if solar and storage resources were difficult to develop or site. Plans 3 and 5 do not differ significantly from the PRP in buildout through the 20-year planning horizon, although provide an alternate aero-derivative gas combustion turbine technology option for the 2029 addition if a frame combustion turbine were difficult to source. Plan 12 is cost competitive with the PRP on both a 20-year and 30-year PVRR basis, providing a potential viable alternative if the requirement for EPA GHG rule compliance should arise. Plan 12 is similar to the PRP in technology buildout with an emphasis on gas turbine resources during the first six years of the 20-year planning horizon. The PRP contains a 175 MW solar development being targeted to commission in 2028,[14] however, resource adequacy changes late in Empire's IRP development may have an impact on this resource. The Company is still

[14] This solar resource is a combination of solar resources from previous IRP PRPs.

evaluating this resource but given the changing dynamics surrounding the SPP's resource adequacy construct, evolving market dynamics, and the timing of this filing, it is not certain that this project will proceed. Empire will provide an update during the next IRP Annual Update as needed. Additionally, the Company has a contingency plan in place from this IRP in case the solar project does not materialize.

20 CSR 4240-22.070(6) states:

> The utility shall develop an implementation plan that specifies the major tasks, schedules, and milestones necessary to implement the preferred resource plan over the implementation period. The utility shall describe and document its implementation plan…

Major areas of focus in Liberty's PRP implementation plan are:

- Make use of the recently completed Residential and Non-Residential Market Study to help develop primary data-driven demand-side programs for the next MEEIA Cycle ("MEEIA Cycle 2");
- Finalize the construction of the 27 MW of industrial gas turbines to directly replace the retirements of Riverton units 10 and 11 in 2026;
- Perform feasibility and environmental studies, begin permitting as required, and issue a request for proposal ("RFP") in preparation for acquiring the 240 MW frame combustion gas turbine to begin operation for 2029;
- Continue to evaluate a new utility-scale solar resource for potential operation as early as 2028;[15]
- Prioritize the implementation of low-, mid-, and high-cost energy efficiency programs from MEEIA Cycle 2 and beyond, as appropriate;
- Monitor federal tax credit policy, cost trends for renewable resources, and co-location opportunities at Liberty-Empire's existing generation resource sites to plan for anticipated additions.

Given that the implementation plan includes implementation of energy efficiency programs from a MEEIA Cycle 2 and beyond, Staff will reiterate its Concern A from section 20 CSR 4240-22.050 Demand-Side Resource Analysis above.

[15] Liberty is considering a contingency plan without the assumed 175 MW firm solar addition in 2028. This plan would add a modest amount of incremental gas in the 2030's to offset lower solar capacity.

Concern A – The RAP level of DSM savings in Empire's PRP is inconsistent with the current level of DSM savings given that Empire does not currently offer DSM programs. To remedy this concern, Empire should update its ARPs to remove DSM bundles from the plans to determine if Plan 4 is still appropriate as Empire's PRP.

Based on its limited review, Staff has identified one concern for Empire's preferred resource plan and resource acquisition strategy.

Concern B – The enactment of the One Big Beautiful Bill ("OBBB") on July 4, 2025, significantly altered the tax landscape. Staff's understanding of the OBBB is that investment tax credits ("ITC") and production tax credits ("PTC") will no longer be available for wind and solar projects that are placed in service after December 31, 2027. However, a special transition rule provides that wind and solar projects that begin construction within one year of the OBBB enactment will still qualify for the ITC or PTC, even if placed in service after 2027. Empire's PRP includes 175 MW solar development being targeted to commission in 2028, however Empire is not certain that this project will proceed. The OBBB could greatly influence whether Empire moves forward with this solar project. Empire has a contingency plan in place from this IRP in case the solar project does not materialize. However, in its PRP, Empire has included 150 MW of utility-scale solar in years 2035 and 2041. Since the OBBB was enacted after Empire filed its 2025 IRP, to remedy this concern, Empire should update its ARPs to remove any tax credits for solar and wind projects placed in service after December 31, 2027.

Staff Expert Witness: Brad Fortson

20 CSR 4240-22.080 Filing Schedule and Requirements

Summary

This rule specifies the requirements for electric utility filings to demonstrate compliance with the provisions of Chapter 22. The purpose of the compliance review required by Chapter 22 is not Commission approval of the substantive findings, determinations, or analyses contained in the filing. The purpose of the compliance review required by Chapter 22 is to determine whether the utility's resource acquisition strategy meets the requirements of Chapter 22. However, if the Commission determines that the filing substantially meets these requirements, the Commission may further acknowledge that the preferred resource plan or resource acquisition strategy is reasonable in whole, or in part, at the time of the finding.

This rule also establishes a mechanism for the utility to solicit and receive stakeholder input to its resource planning process.

The Filing Schedule, Filing Requirements, and Stakeholder Process Rule establish a filing deadline for all electric utilities on April 1 of each year. A triennial compliance filing is due every third year with more informal annual update filings during the years between the full triennial compliance filings. The annual updates are coupled with a stakeholder workshop to communicate changing conditions and utility plans and to seek comments and suggestions from stakeholders during the planning process. Preliminary plans are reviewed with stakeholders to receive input regarding potential concerns and deficiencies. However, once plans are filed, stakeholders again have the opportunity to identify potential concerns and deficiencies. The Commission, with input from stakeholders, will identify special contemporary issues each year for each utility to analyze during its planning process. To make the resource planning process more meaningful, the rule requires action from the utility if its business plan or acquisition strategy becomes inconsistent with the latest adopted preferred resource plan filed by the utility. The rule also requires certification that any request of action from the Commission is consistent with the utility's adopted preferred resource plan.

Based on its limited review, Staff has not identified any deficiencies or concerns related to Empire and 20 CSR 4240-080.

Staff Expert Witness: Brad Fortson

BEFORE THE PUBLIC SERVICE COMMISSION

OF THE STATE OF MISSOURI

In the Matter of the 2025 Triennial Compliance Filing Pursuant to 20 CSR 4240-22 by The Empire District Electric Company d/b/a Liberty	))))	Case No. EO-2024-0280

AFFIDAVIT OF OBIANUJU EZENWANNE

STATE OF MISSOURI)
) ss.
COUNTY OF COLE)

COMES NOW OBIANUJU EZENWANNE and on her oath declares that she is of sound mind and lawful age; that she contributed to the foregoing *Staff Report;* and that the same is true and correct according to her best knowledge and belief.

Further the Affiant sayeth not.

OBR

OBIANUJU EZENWANNE

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 27th day of August 2025.

Dianna L. Vaught

Notary Public

DIANNA L. VAUGHT
Notary Public - Notary Seal
State of Missouri
Commissioned for Cole County
My Commission Expires: July 18, 2027
Commission Number: 15207377

BEFORE THE PUBLIC SERVICE COMMISSION

OF THE STATE OF MISSOURI

In the Matter of the 2025 Triennial Compliance Filing Pursuant to 20 CSR 4240-22 by The Empire District Electric Company d/b/a Liberty	))))	Case No. EO-2024-0280

AFFIDAVIT OF BRAD J. FORTSON

STATE OF MISSOURI)
) ss.
COUNTY OF COLE)

COMES NOW BRAD J. FORTSON and on his oath declares that he is of sound mind and lawful age; that he contributed to the foregoing *Staff Report;* and that the same is true and correct according to his best knowledge and belief.

Further the Affiant sayeth not.

BRAD J. FORTSON

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 28th day of August 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

BEFORE THE PUBLIC SERVICE COMMISSION

OF THE STATE OF MISSOURI

In the Matter of the 2025 Triennial Compliance Filing Pursuant to 20 CSR 4240-22 by The Empire District Electric Company d/b/a Liberty	))))	Case No. EO-2024-0280

AFFIDAVIT OF JORDAN T. HULL

STATE OF MISSOURI	)	
	)	ss.
COUNTY OF COLE	)	

COMES NOW JORDAN T. HULL and on his oath declares that he is of sound mind and lawful age; that he contributed to the foregoing *Staff Report;* and that the same is true and correct according to his best knowledge and belief.

Further the Affiant sayeth not.

JORDAN T. HULL

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 27th day of August 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