MISSOURI PUBLIC SERVICE COMMISSION

STAFF REPORT ON

UNION ELECTRIC COMPANY,
d/b/a AMEREN MISSOURI

ELECTRIC UTILITY RESOURCE PLANNING
COMPLIANCE FILING

FILE NO. EO-2021-0021

Jefferson City, Missouri
March 31, 2021

** Denotes Confidential Information **

*** Denotes Highly Confidential Information ***

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Executive Summary

On September 27, 2020, Union Electric Company, d/b/a Ameren Missouri ("Ameren Missouri" or "Company"), filed its 2020 Integrated Resource Plan ("IRP") triennial compliance filing ("Filing") in File No. EO-2021-0021, as required by 20 CSR 4240-22 Electric Utility Resource Planning and the Missouri Public Service Commission's ("Commission") November 6, 2019 *Order Granting Variances* in File No. EE-2020-0007.[1]

Commission Rule 20 CSR 4240-22.080(7) provides that:

> (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 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 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 Staff's Report ("Report"), Staff identified two deficiencies and three concerns regarding Ameren Missouri's 2020 IRP Filing:

[1] Approved waivers include: 20 CSR 4240-22.040(3)(A); .045(1)(B) and (3)(C); .060(5)(E), (5)(F), (5)(K), (5)(L) and (7); and .080(2)(C)2.

List of Staff's Identified Deficiencies

Deficiency 1 – Ameren Missouri did not consider and analyze non-renewable supply-side resources on an equivalent basis as renewable supply-side resources and demand-side resources as required by 20 CSR 4240-22.010(2)(A).

Ameren Missouri did not evaluate non-renewable supply-side resources on an equivalent basis as renewable supply-side resources and demand-side resources. Ameren Missouri also evaluated supply-side resources differently than demand-side resources by utilizing different avoided capacity cost curves.[2] This difference in methodologies does not allow demand-side resources, renewable supply-side resources, and non-renewable supply-side resources to be considered and analyzed on an equivalent basis and skews the result of the subsequent analyses reported within Ameren Missouri's 2020 IRP Filing.

Deficiency 2 – Ameren Missouri did not use a consistent avoided capacity cost throughout its triennial compliance filing as required by 20 CSR 4240-22.050(5)(A)1.

For Ameren Missouri's 2020 IRP Filing, a market-based capacity price was used in evaluating non-renewable supply-side resources. However, a separate capacity price curve was developed to be used in future DSM program cost-effectiveness analyses. This curve is a combination of the market-based capacity price forecast and the cost of new entry ("CONE") value.[3]

List of Staff's Identified Concerns

Concern A – Ameren Missouri's avoided capacity cost is overstated due to the premature move to CONE in 2029.

In determining when to move to a CONE value when developing its avoided capacity costs, Ameren Missouri reviewed a planning scenario in which there were no more DSM programs beyond MEEIA Cycle 3 and with retirement of ** — ** coal-fired units by the end of ** ____ **. Based on that review, Ameren Missouri states that the first year that a new supply-side resource would be needed in such a scenario to strictly meet Midcontinent Independent

[2] Chapter 2, page 14, of Ameren Missouri's 2020 IRP Filing.
[3] Chapter 2, page 14, of Ameren Missouri's 2020 IRP Filing.

System Operator ("MISO") planning reserve requirements was found to be 2029. However, the preferred plan selected by Ameren Missouri assumes retirement of ** ___ ** coal-fired units by the end of ** ____ **. The preferred plan also assumes roughly ** ____ ** MW of new renewable generation by the end of ** ____ **. Both assumptions, if used in the development of avoided capacity costs, would lower the avoided capacity costs by some amount since the move to CONE would likely be pushed out to some year beyond 2029. Further, Staff reviewed all alternative resource plans ("ARPs") in which there were no DSM programs beyond MEEIA Cycle 3 and it appears no new non-renewable supply-side resource is needed prior to ** ____ **. Ameren Missouri's "no DSM contingency plan" does not show a need for a new non-renewable supply-side resource until ** ____ **. Staff also has concerns with the move from a market-based cost to CONE in one year's time. Thus, Staff's concern is that Ameren Missouri's avoided capacity cost is overstated due to the premature move to CONE in 2029.

Concern B - The 2020 Market Potential Study began in March 2019 and was completed in March 2020. Therefore, the 2020 Market Potential Study relied on the avoided costs developed as part of Ameren Missouri's 2017 IRP to complete the initial screening analysis and identify cost-effective measures to be included in each demand-side management portfolio of the 2020 IRP.[4]

Concern C – The risk potentially borne by ratepayers from Ameren Missouri's unprecedented shift toward new renewable wind and solar generation.

Ameren Missouri's preferred resource plan and resource acquisition strategy is an aggressive approach that includes its largest ever expansion of renewable wind and solar generation,[5] bringing Ameren Missouri to 3100 MW of wind and solar by 2030 and 5400 MW of wind and solar by 2040.

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."

[4] Chapter 8, page 6, of Ameren Missouri's 2020 IRP Filing.
[5] *See* attached Confidential Addendum A for the preferred resource plan renewable additions and non-renewable retirements.

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 —
>
> > (A) Consider and **analyze demand-side resources, renewable energy, and supply-side resources on an equivalent basis**,[6] subject to compliance with all legal mandates that may affect the selection of utility electric energy resources, in the resource planning process; **[Emphasis added.]**

Staff performed its review of Ameren Missouri's 2020 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 Ameren Missouri's 2020 IRP Filing does not meet the requirements of rule 20 CSR 4240-22.010 due to the following deficiency.

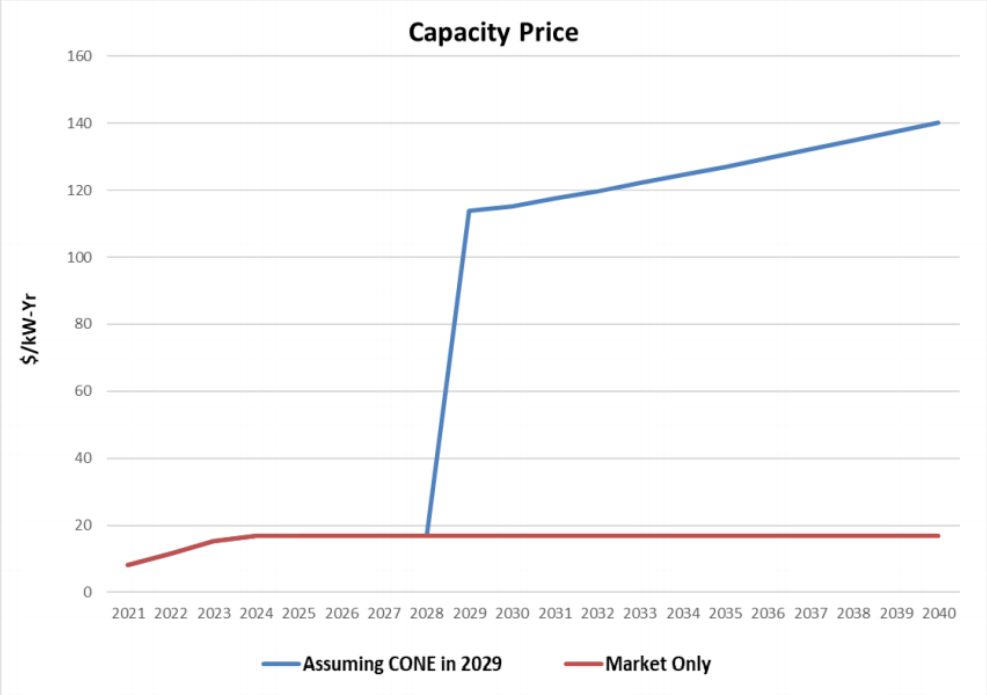
Deficiency

Deficiency 1 – Ameren Missouri did not evaluate non-renewable supply-side resources on an equivalent basis as renewable supply-side resources and demand-side resources. Ameren Missouri also evaluated supply-side resources differently than demand-side resources by utilizing different avoided capacity cost curves.[7] This difference in methodologies does not allow demand-side resources, renewable supply-side resources, and non-renewable supply-side resources to be considered and analyzed on an equivalent basis and skews the result of the subsequent analysis reported within Ameren Missouri's 2020 IRP Filing.

[6] Although the rule does not specifically say renewable and non-renewable supply-side resources, it is implied by listing each separately and including an "and."
[7] Chapter 2, page 14 of Ameren Missouri's 2020 IRP Filing.

As part of Chapter 2 in its 2020 IRP Filing, Ameren Missouri provided Figure 2.5,[8] which depicts the capacity price assumptions utilized as well as descriptions for how the curves were estimated. Ameren Missouri's Figure 2.5 follows.

Figure 2.5 Capacity Price Assumptions



As explained in more detail on Chapter 2, page 14 of Ameren Missouri's IRP filing, the market based capacity curve was used for the integration and risk analysis. According to Ameren Missouri's response to Sierra Club Data Request No. 1, "the value of capacity is used in calculating the PVRR. As a member of MISO, all capacity sold in [sic] into the MISO market and that market revenue is used to reduce revenue requirements… During the planning process, when Ameren Missouri determines that there is insufficient owned capacity resources to meet the need of customers in a planning year, market purchases are made up to 300 MWs of capacity to meet our reserve requirements."

Ameren Missouri is not analyzing and considering non-renewable supply-side resources on an equivalent basis with renewable supply-side resources or demand-side resources as demonstrated by the following excerpt from Chapter 9 of Ameren Missouri's IRP filing:

[8] Chapter 2, page 15 of Ameren Missouri's 2020 IRP Filing.

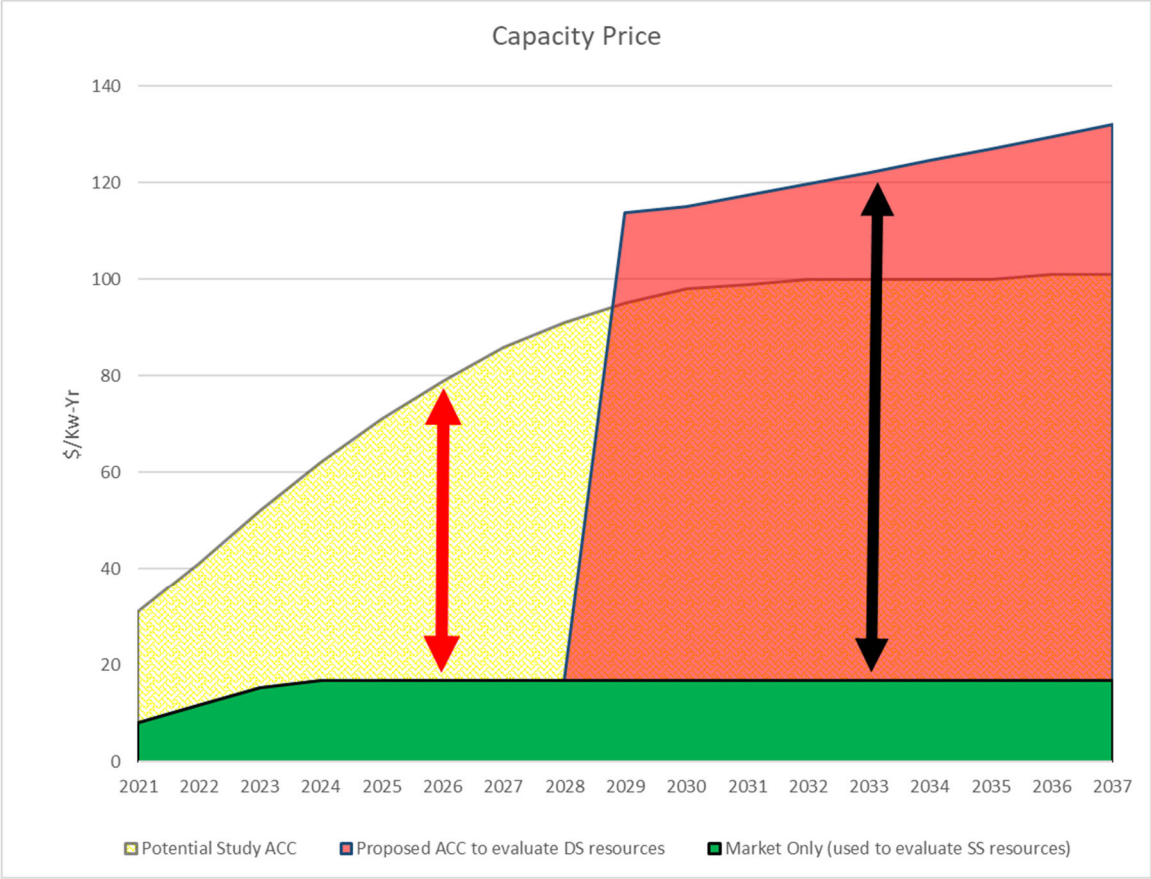
> After including DSM resources and the renewable portfolios, if the capacity shortfall in a given year met or exceeded the build threshold, then supply side resources are added to eliminate the shortfall. The build threshold was determined to be 300 MW regardless of the type of supply-side resource under consideration and reflects a level that Ameren Missouri trading staff assess as a reasonable level of capacity market dependence.

Ameren Missouri correctly limits non-renewable supply-side resource additions to periods of projected capacity needs. Furthermore, Ameren Missouri staff has identified that 300 MW is a "reasonable level of capacity market dependence" while simultaneously proposing to implement vast demand-side resource programs and invest in thousands of megawatts of renewable resources regardless of the need to do so. These differences in methodologies do not allow the resources to be considered and analyzed on an equivalent basis and can have a drastic impact on the estimation of net present value of revenue requirement ("NPVRR") because *** _____ _____ [9] _____ _____ ***[10]

In contrast, "a separate capacity price curve was also developed to be used in future demand-side resource cost effectiveness analyses."[11] This "separate capacity price curve" should be dismissed as it does not realistically reflect costs which may be avoided resulting from implementation of demand-side resources and has the potential to artificially inflate "proposed benefits" of future demand-side programs. Furthermore, the demand-side resources included as options within this analysis were screened utilizing avoided capacity costs which were much higher than not only the "market only curve" but also the "separate capacity price curve." This likely resulted in demand-side programs and measures being included which may not have been deemed cost effective when utilizing the "market only curve." This would also have an impact on the resulting NPVRR of any given plan. Graph 1 below illustrates the differing capacity costs utilized by Ameren Missouri for various resource types within the triennial filing.

[9] Ameren Response to Sierra Club Data Request No. 01 HC.
[10] Ameren Response to Sierra Club Data Request No. 2.7.
[11] Chapter 2, page 14 of Ameren Missouri's 2020 IRP compliance filing.

Graph 1: Capacity Cost



The black arrow in Graph 1 reflects the difference between the capacity value of supply-side resources within Ameren Missouri's integrated analysis and the capacity cost that Ameren Missouri is proposing to utilize to evaluate future demand-side resources. This drastic difference in valuation of demand-side resources as compared to the valuation of supply-side resources does not allow the two types of resources to be evaluated on an equivalent basis. See Concern B below for the discussion of the red arrow.

To remedy this deficiency, Ameren Missouri should utilize the "market only" capacity cost curve when evaluating any future demand-side resources in order to evaluate supply-side resources on an equivalent basis as demand-side resources. Ameren Missouri should also provide analysis quantifying all savings resulting from the implementation of the demand-side resources within the preferred resource plan that can reasonably be expected to avoid costs to ratepayers through concrete verifiable reductions in rates. This analysis should include evidence of reduced

MISO costs and expected revenue from excess capacity sales. Furthermore, Ameren Missouri should maintain build thresholds for non-renewable supply-side resources as well as renewable supply-side resources and demand-side resources based upon the projected capacity need for reserve requirements.

Staff Expert Witnesses: Brad J. Fortson and J Luebbert

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 the "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." Further, 20 CSR 4240-22.030(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."

Accurate load forecasting models are essential to the operation and planning of a utility. Load forecasting helps a utility make important decisions including decisions on purchasing and generating electric power, load switching, and infrastructure development. The Load Analysis and Load Forecasting Rule allows the utility to use multiple analytical methods for performing its load analysis and develop its forecasts, leaving it to the utility's discretion to choose the methods by which it achieves the stated purpose of the Rule.

Ameren Missouri has developed a range of load forecasts deploying the Statistically Adjusted End-use forecasting tools and methods used to develop the forecasts providing a solid analytical basis for testing and refining the assumptions used in the development of the potential

demand-side resource portfolios[12]. The planning case forecast projects Ameren Missouri's retail sales to grow by 0.7% annually between 2021 and 2040, and retail peak demand to grow by 0.5% per year.

Ameren Missouri did not request any waivers from specific provisions of this Rule.

Staff found no deficiencies concerning compliance with this rule and Staff has not identified any concerns. In Staff's opinion, the Integrated Resource Analysis filing meets the Load Analysis and Load Forecasting requirements of 20 CSR 4240-22.030.

Staff Expert Witness: Krishna L. Poudel

20 CSR 4240-22.040 Supply-Side Resource Analysis

Summary

Rule 20 CSR 4240-22.040 Supply-Side Resource Analysis requires Ameren Missouri to review existing resources for opportunities to upgrade or retire existing resources and also review a wide variety of supply-side resource options to determine cost estimates for each type of resource.

Resource options are to be ranked based upon their relative levelized annual costs,[13] 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 option using the utility discount rate.[14] Resources which do not have significant disadvantages and pass the pre-screening process are to be included in the integrated resource analysis process used to select a preferred resource plan.

Ameren Missouri selected two natural gas technologies as final candidate resource options based on supply-side screening analysis[15]: Gas Combined Cycle and Gas Simple Cycle Combustion. Gas Combined Cycle exhibit the lowest levelized cost of energy ("LCOE") among conventional generation resources. Solar, Wind, Battery storage, and Pump storage have been identified as other candidate resources.

[12] 20 CSR 4240-22.030(1)(A).
[13] 20 CSR 4240-22.020(29) Levelized cost means the dollar amount of a fixed annual payment for which a stream of those payments over a specified period of time is equal to a specified present value based on a specified rate of interest.
[14] 20 CSR 4240-22.040(2)(A).
[15] 20 CSR 4240-22.040(2).

Ameren Missouri evaluated the levelized cost of the existing supply-side resources as well as the selected candidate resources. Capital costs for all of the preliminary candidate supply-side options included transmission interconnection costs.[16]

Table 5.1 from Chapter 5 of the IRP filing summarizes the current environmental regulations for which Ameren Missouri must implement mitigation measures, along with expectations for compliance requirements for certain potential regulations.[17]

With respect to rule 20 CSR 4240-22.040 Supply-Side Resource Analysis, Ameren Missouri requested, and the Commission granted, in File No. EE-2020-0007, one variance of the provisions required by 20 CSR 4240-22.040(3)(A).[18]

Staff has not identified any deficiencies or concerns related to Ameren Missouri's supply-side resource analysis.

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.

Since 2004, Ameren Missouri has been a member of the Midcontinent Independent System Operator, or MISO, a RTO. MISO was approved as the nation's first RTO in 2001 and is an

[16] Ameren Missouri's 2020 IRP Filing, Chapter 6, page 16.
[17] Ameren Missouri's 2020 IRP Filing, Chapter 5, page 3.
[18] Commission Order issued on November 6, 2019, File No. EE-2020-0007.

independent nonprofit organization that supports the delivery of wholesale electricity and operates energy and capacity markets in 15 U.S. states and the Canadian province of Manitoba. A key responsibility of the MISO is the development of the annual MISO Transmission Expansion Plan ("MTEP"). Ameren Missouri is an active participant in the MISO MTEP development process.

With respect to rule 20 CSR 4240-22.045 Transmission and Distribution Analysis, Ameren Missouri requested, and the Commission granted, in File No. EE-2020-0007, variances of the provisions required by 20 CSR 4240-22.045(1)(B) and 20 CSR 4240-22.045(3)(C).[19]

Staff has not identified any deficiencies or concerns related to Ameren Missouri's transmission and distribution analysis.

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 methods by which end-use measures and demand-side programs shall be developed and screened for cost-effectiveness. It also requires the ongoing evaluation of end-use measures and programs, and the use of program evaluation, measurement and verification ("EM&V") to improve program design and cost-effectiveness analysis.

Ameren Missouri continues to build on its DSM planning, implementation, and evaluation performance from its initial implementation of DSM programs in 2009 followed by MEEIA Cycle 1 from January 1, 2013, through December 31, 2015, MEEIA Cycle 2 from March 1, 2016, through February 28, 2019,[20] and MEEIA Cycle 3 which began March 1, 2019, and is scheduled to end December 31, 2022.[21]

Ameren Missouri contracted with GDS Associates, Brightline Group, and the American Council for an Energy Efficient Economy ("ACEEE") to perform its 2020 DSM Market Potential

[19] Commission Order issued on November 6, 2019, File No. EE-2020-0007.
[20] Commission's July 20, 2017, *Order Approving Stipulation And Agreement* in Case No. EO-2015-0055, established a process for Cycle 2 long-lead energy efficiency projects' implementation and completion to extend for up to 24 months beyond the February 28, 2019 Cycle 2 end date.
[21] Commission's August 5, 2020, *Order Approving Stipulation and Agreements* in Case No. EO-2018-0211, extended MEEIA Cycle 3 through December 31, 2022.

Study to assess energy savings potential to help inform the Demand-Side Resource Analysis required by 20 CSR 4240-22.050 in Ameren Missouri's 2020 IRP Filing. Additionally, Opinion Dynamics Corp. ("ODC"), Ameren Missouri's current EM&V contractor, was also requested to conduct primary market research to help inform key inputs in the 2020 DSM Market Potential Study.

Key components of the 2020 Market Potential Study analysis include: 1) New Primary Research (the first since the 2013 Market Potential Study), including an updated assessment of end use measure penetration and saturation and customer willingness to participate and adoption rates in DSM programs at various incentive levels; 2) Updated methodologies to account for the interactive effects of DSM measures that segregate results by building types and income strata and calibrate first year results to existing program delivery; 3) Income Eligible potential evaluated against a range of new and expanded policy-oriented scenarios and sensitivities, which highlight important considerations for future program implementation; 4) An expanded Distributed Energy Resource potential study, including a sensitivity analysis of increased transmission and distribution avoided costs representing locational value; and 5) A comprehensive scenario analysis across all sectors used to inform the load and cost risk adjusted analysis of DSM portfolios.

The 2020 Market Potential Study began in March 2019 and was completed in March 2020. Therefore, the 2020 Market Potential Study relied on the avoided costs developed as part of Ameren Missouri's 2017 IRP to complete the initial screening analysis and identify cost-effective measures to be included in each portfolio. The financial market-based capacity curve used for Ameren Missouri's 2020 IRP differs from the market-based capacity curve used in Ameren Missouri's 2017 IRP. Ameren Missouri's 2017 IRP was developed using the Midas production cost modeling software. For Ameren Missouri's 2020 IRP, a separate capacity price curve was developed to be used in future DSM program cost-effectiveness analysis. This curve is a combination of the market-based capacity price forecast and the CONE.

Ameren Missouri did not request any waivers from specific provisions of this Rule.

Based on its limited review, Staff concludes Ameren Missouri's Demand-Side Resource Analysis filing does not meet the requirements of rule 20 CSR 4240-22.050 due to the following deficiency. Staff also provides its concerns over the avoided capacity cost used by Ameren Missouri in its 2020 IRP.

Deficiency

Deficiency 2 – Ameren Missouri did not use a consistent avoided capacity cost throughout its triennial compliance filing as required by 20 CSR 4240-22.050(5)(A)1.

20 CSR 4240-22.050(5)(A)1. provides that:

> The utility avoided demand cost shall include the capacity cost of generation, transmission, and distribution facilities, adjusted to reflect reliability reserve margins and capacity losses on the transmission and distribution systems, **or** the corresponding market-based equivalent of those costs. The utility shall describe and document how it developed its avoided demand cost, and **the capacity cost chosen shall be consistent throughout the triennial compliance filing. [Emphasis added.]**

For Ameren Missouri's 2020 IRP Filing, a market-based capacity price was used in evaluating supply-side resources. However, a separate capacity price curve was developed to be used in future DSM program cost-effectiveness analysis. This curve is a combination of the market-based capacity price forecast and the cost of new entry ("CONE") value.[22]

To remedy this deficiency, Ameren Missouri should utilize the "market only" capacity cost curve when evaluating any future demand-side resources in order to evaluate supply-side resources on an equivalent basis as demand-side resources. Ameren Missouri should also provide analysis quantifying all savings resulting from the implementation of the demand-side resources within the preferred resource plan that can reasonably be expected to avoid costs to ratepayers through concrete verifiable reductions in rates. This analysis should include evidence of reduced MISO costs and expected revenue from excess capacity sales. Furthermore, Ameren Missouri should maintain build thresholds for non-renewable supply-side resources as well as renewable supply-side resources and demand-side resources based upon the projected capacity need for reserve requirements.

Concerns

Concern A – Ameren Missouri's avoided capacity cost is overstated due to the premature move to CONE in 2029.

In determining when to move to a CONE value when developing its avoided capacity costs, Ameren Missouri reviewed a planning scenario in which there were no more DSM programs

[22] Chapter 2, page. 14, of Ameren Missouri's 2020 IRP Filing.

beyond MEEIA Cycle 3 and with retirement of ** — ** coal-fired units by the end of ** ___ **. Based on that review, Ameren Missouri states that the first year that a new supply-side resource would be needed in such a scenario to strictly meet MISO planning reserve requirements was found to be 2029. However, the preferred plan selected by Ameren Missouri assumes retirement of ** ___ ** coal-fired units by the end of ** ___ **. The preferred plan also assumes roughly ** ___ ** MW of new renewable generation by the end of ** ___ **. Both assumptions, if used in the development of avoided capacity costs, would lower the avoided capacity costs by some amount since the move to CONE would likely be pushed out to some year beyond 2029. Further, Staff reviewed all ARPs in which there were no DSM programs beyond MEEIA Cycle 3 and it appears no new non-renewable supply-side resource is needed prior to ** ___ **. Ameren Missouri's "no DSM contingency plan" does not show a need for a new non-renewable supply-side resource until ** ___ **. Thus, Staff's concern is that Ameren Missouri's avoided capacity cost is overstated due to the premature move to CONE in 2029. Artificially inflating avoided capacity costs affects the screened cost effectiveness of each measure and program analyzed and results in unrealistic estimations of the impact of demand-side resources. In order to properly analyze supply-side resources and demand-side resources on an equivalent basis, avoided costs should be applied equally and in a manner that best mirrors the reality of a given scenario.

To remedy Concern A, Ameren Missouri should utilize the "market only" capacity cost curve when evaluating any future demand-side resources in order to evaluate supply-side resources on an equivalent basis as demand-side resources. Ameren Missouri should also provide analysis quantifying all savings resulting from the implementation of the demand-side resources within the preferred resource plan that can reasonably be expected to avoid costs to ratepayers through concrete verifiable reductions in rates. This analysis should include evidence of reduced MISO costs and expected revenue from excess capacity sales. Furthermore, Ameren Missouri should maintain build thresholds for non-renewable supply-side resources as well as renewable supply-side resources and demand-side resources based upon the projected capacity need for reserve requirements.

Concern B - The 2020 Market Potential Study began in March 2019 and was completed in March 2020. Therefore, the 2020 Market Potential Study relied on the avoided costs developed as part of Ameren Missouri's 2017 IRP to complete the initial screening analysis and

identify cost-effective measures to be included in each demand-side management portfolio of the 2020 IRP. The avoided costs developed as part of Ameren Missouri's 2017 IRP are higher than those developed as part of Ameren Missouri's 2020 IRP. In the years 2021 – 2028, for example, the avoided capacity costs in the 2017 IRP are much higher than those in the 2020 IRP, as much as roughly four times higher in year 2028. Using the higher avoided costs (2017 IRP) for demand-side screening will likely lead to screening in energy efficient measures that would not be cost effective using the lower avoided costs (2020 IRP). Most concerning is the years of 2021 – 2028. Since the 2017 IRP avoided costs, specifically the avoided capacity costs, are so much higher than the 2020 IRP avoided costs in the early years of 2021 – 2028, measures with short lives and lesser savings are very likely to have been screened in as cost-effective in the demand-side portfolios of the ARPs in the 2020 IRP. Using the 2017 avoided costs for demand-side management screening in the 2020 IRP likely creates a mismatch of avoided costs and cost-effective savings for all ARPs which include a demand-side portfolio. The red arrow in Graph 1 above helps illustrate this concern. The shaded area in which the red arrow lies is the portion of concern. Measures that fall within that shaded portion are considered cost-effective using the 2017 IRP avoided capacity costs but would not be considered cost-effective using the 2020 IRP avoided capacity costs.

To remedy Concern B, Ameren Missouri should utilize the "market only" capacity cost curve when evaluating any future demand-side resources in order to evaluate supply-side resources on an equivalent basis as demand-side resources. Ameren Missouri should also provide analysis quantifying all savings resulting from the implementation of the demand-side resources within the preferred resource plan that can reasonably be expected to avoid costs to ratepayers through concrete verifiable reductions in rates. This analysis should include evidence of reduced MISO costs and expected revenue from excess capacity sales. Furthermore, Ameren Missouri should maintain build thresholds for non-renewable supply-side resources as well as renewable supply-side resources and demand-side resources based upon the projected capacity need for reserve requirements.

Staff Expert Witnesses: Brad J. Fortson and Jordan T. Hull

20 CSR 4240-22.060 Integrated Resource Analysis

Summary

This Rule requires the utility to design alternative resource plans 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 alternative plans 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.

Ameren Missouri developed, considered, and analyzed the present worth of long-run utility costs for 28 alternative resource plans by calculating the present value of revenue requirements ("PVRR") for each plan. While Ameren Missouri has selected the minimization of PVRR as the primary selection criterion for the preferred plan in accordance with 20 CSR 4240-22.010(2)(B), Ameren Missouri does not use minimization of PVRR as the only selection criterion. In addition to calculating the PVRR for each plan, Ameren Missouri considered the performance of each plan when compared to four other planning objectives. These planning objectives are Portfolio Transition (formerly Environmental/Renewable/Resource Diversity), Financial/Regulatory, Customer Satisfaction, and Economic Development. The alternative resource plans include various levels of demand-side programs and rates, renewable resources, new supply-side resources, and coal retirements.

With respect to Rule 20 CSR 4240-22.060 Integrated Resource Analysis, Ameren Missouri requested, and the Commission granted, in File No. EE-2020-0007, variances of the provisions required by 20 CSR 4240-22.060(5)(E), 20 CSR 4240-22.060(5)(F), 20 CSR 4240-22.060(5)(K), 20 CSR 4240-22.060(5)(L), and 20 CSR 4240-22.060(7).[23]

[23] Commission Order issued on November 6, 2019, File No. EE-2020-0007.

The Staff has not identified any deficiencies or concerns related to Ameren Missouri's integrated resource analysis.

Staff Expert Witnesses: Jordan T. Hull and Brad J. Fortson

20 CSR 4240-22.070 Risk Analysis and Strategy Selection

Summary

Rule 20 CSR 4240-22.070, Risk Analysis and Strategy Selection, 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.

Ameren Missouri's final probability tree consists of the following dependent and independent critical uncertain factors:

Dependent critical uncertain factors

- Carbon policy
- Natural gas prices

Independent critical uncertain factors

- DSM costs only
- Load Growth

Ameren Missouri's decision-makers chose to use a scorecard approach to evaluate its 28 candidate resource plans during their strategy selection process to adopt a resource acquisition strategy and a preferred resource plan for Ameren Missouri. Ameren Missouri created a scorecard that embodies its planning objectives mentioned above in section 20 CSR 4240-22.060 Integrated Resource Analysis, to evaluate the performance of alternative resource plans. The scorecard with composite scores for each planning objective is included as attached Confidential Addendum B.

Attached Confidential Addendum C includes Ameren Missouri's 2020 IRP adopted preferred resource plan, contingency resource plans, and resource acquisition strategy implementation plan for the adopted preferred resource plan. Finally, the capacity balance sheet for Ameren Missouri's adopted preferred resource plan is included as attached Confidential Addendum D.

Ameren Missouri did not apply for any waivers from the requirements of this rule.

Based on its limited review, Staff has identified one (1) concern for Ameren Missouri's preferred resource plan and resource acquisition strategy.

Concerns

Concern C - Risk potentially borne by ratepayers from Ameren Missouri's unprecedented shift toward new renewable wind and solar generation.

Ameren Missouri's preferred resource plan and resource acquisition strategy is an aggressive approach that includes its largest ever expansion of renewable wind and solar generation, bringing Ameren Missouri to 3100 MW of wind and solar by 2030 and 5400 MW of wind and solar by 2040. On pages 12-14 of Chapter 10 of Ameren Missouri's IRP filing, Ameren Missouri included a subsection titled "Ameren Missouri's Need for Energy Resources." Staff submitted a data request to Ameren Missouri asking for citations of each federal rule or law, Missouri rule or law, and/or MISO tariff that requires Ameren Missouri to generate energy in excess of the Ameren Missouri load. Ameren Missouri's Director of Corporate Analysis, Matt Michels, responded that he was "not aware of any such federal, state, or MISO tariff requirements currently in effect." Due to Ameren Missouri's participation in MISO, Ameren Missouri purchases all energy necessary to meet its customers' load. Conversely, any net output from Ameren Missouri's generating units are sold to MISO at the generation node Locational Marginal Price ("LMP"). Adding large amounts of renewable generation that are not required to meet MISO resource adequacy requirements or Missouri statutory or rule requirements, including providing safe and adequate service, may place an undue level of risk on ratepayers based upon the speculation that the market revenues, which are inherently uncertain, will exceed the overall cost of the assets. Ameren Missouri inherently benefits shareholders by adding large investments from which it can seek a return on the investment through rates throughout the life of the asset. Ameren Missouri also decides which factors to consider within the IRP process as well as the weight to apply to each critical uncertain factor. When a utility needs a generating asset to fulfill the needs of customers or to comply with mandated requirements, the IRP process provides a decision making tool to optimize the necessary generation additions and minimize the net present value of revenue requirements at a point in time when those assets are necessary to meet the expected retail load needs. However, when a utility does not need to build assets to fulfill the needs of customers or comply with mandated requirements, the results of the decision are

inherently uncertain, which introduces risk to ratepayers, while the costs of the generation addition are much more certain. At this point in time, Ameren Missouri has not demonstrated the need for the proposed additional renewable generation. Ameren Missouri objected to Staff's request for comparisons of shareholder risks and ratepayer risks for the proposed additional generation resources stating that "it objects to each of them to the extent that they call for a legal conclusion or otherwise seek to require the Company to engage in research or analyses instead of seeking discovery of existing facts, documents, or information and, to that extent, the questions are beyond the scope of proper discovery."

20 CSR 4240-22.080(7) requires Staff to provide at least one (1) suggested remedy for each identified concern. Staff's concern is one of a general nature. However, Staff recommends that Ameren Missouri provide detailed analysis comparing ratepayer risks and shareholder risks for additional generation resources which are not required to meet federal, state, or MISO requirements.

Staff Expert Witnesses: Brad J. Fortson and J Luebbert

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.[24] 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.

Ameren Missouri requested and received approval of a variance from 20 CSR 4240-22.080(2)(C)2.[25]

The Staff has not identified any deficiencies or concerns related to the Filing Schedule and Requirements.

Staff Expert Witness: Brad J. Fortson

Attachments:

Confidential Addendum A - Preferred Resource Plan

Confidential Addendum B - Preferred Plan Selection Scorecard

Confidential Addendum C - Preferred Plan and Contingency Plans

Confidential Addendum D - Forecast of Capacity Balance (MW)

[24] Ameren Missouri filed its *Notice of Case Filing and Request for Variance from 4 CSR 240-22.080(1)(C) and 3* on October 16, 2018, in File No. EE-2019-0104. The Commission granted Ameren Missouri's request in its *Order Granting Variance* issued on November 28, 2018.

[25] Commission Order issued on November 6, 2019, File No. EE-2020-0007.

BEFORE THE PUBLIC SERVICE COMMISSION

OF THE STATE OF MISSOURI

In the Matter of Union Electric Company d/b/a Ameren Missouri's 2020 Utility Resource Filing Pursuant to 20 CSR 4240 – Chapter 22	))))	File No. EO-2021-0021

AFFIDAVIT OF BRAD J. FORTSON, J LUEBBERT, KRISHNA L. POUDEL, JORDAN T. HULL

STATE OF MISSOURI)
) ss.
COUNTY OF COLE)

COME NOW Brad J. Fortson, J Luebbert, Krishna L. Poudel, Jordan T. Hull, and on their oath declares that they are of sound mind and lawful age; that they contributed to the foregoing *Staff Report*; and that the same is true and correct according to their best knowledge and belief, under penalty of perjury.

Further the Affiants sayeth not.

/s/ Brad J. Fortson
Brad J. Fortson

/s/ J Luebbert
J Luebbert

/s/ Krishna L. Poudel
Krishna L. Poudel

/s/ Jordan T. Hull
Jordan T. Hull

ADDENDUMS A, B, C and D

HAVE BEEN DEEMED

CONFIDENTIAL

IN THEIR ENTIRETY