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MISSOURI PUBLIC SERVICE COMMISSION

File No. ER-2024-0319

REBUTTAL TESTIMONY

OF

JUSTIN DAVIES

ON

BEHALF OF

UNION ELECTRIC COMPANY

d/b/a Ameren Missouri

St. Louis, Missouri
January, 2025

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I. INTRODUCTION

Q. Please state your name and business address.

A. My name is Justin Davies. My business address is One Ameren Plaza, 1901 Chouteau Ave., St. Louis, Missouri.

Q. By whom are you employed and what is your position?

A. I am employed by Ameren Services Company ("Ameren Services") as Director of Transmission Planning.

Q. What are your responsibilities as Director of Transmission Planning?

A. Ameren Services' Transmission Planning group provides transmission planning and related services for Ameren Corporation's transmission-owning subsidiaries, Ameren Transmission Company of Illinois ("ATXI"), Ameren Illinois Company d/b/a Ameren Illinois ("Ameren Illinois"), and Union Electric Company d/b/a Ameren Missouri ("Ameren Missouri"). In general, the Transmission Planning group applies the same established Ameren Transmission Planning Criteria and Guidelines, as filed with the Federal Energy Regulatory Commission ("FERC"), across all the electric transmission-owning utilities. As Director of Transmission Planning, I am generally responsible for the conceptual design and optimum development of those utilities' electric transmission systems, which I refer to collectively as the "Ameren Transmission System."

Q. Please describe your educational background and employment experience.

A. I graduated from Bath University in 1995 with both a Bachelor of Engineering and Master of Engineering in Electrical and Electronic Engineering. I have held a Professional Engineering License in the State of Missouri since 2001. I have 27 years of electric utility experience, working as an electrical engineer for London Electricity and the City Utilities of Springfield, Missouri before starting with the Ameren family of companies in 2002. For the majority of my career at Ameren, I have worked in Ameren Services' System Protection group, designing control schemes, setting relays, and performing fault analysis across the entirety of the Ameren electrical system, including the generation, transmission, and distribution functions. In 2015, I accepted the position of Supervisor of Transmission System Protection, supervising System Protection engineers. In 2019, I became the Manager of Transmission Planning, which evolved into my current role as Director of Transmission Planning, leading a team of engineers performing transmission planning for the entire Ameren Transmission System. In 2021, in addition to my role at Ameren Services, I became an adjunct instructor at Washington University teaching Power Electronics to junior and senior year college students.

Q. Have you previously testified before the Missouri Public Service Commission?

A. Yes, I have submitted direct testimony in File No. EA-2024-0302 on behalf of Ameren Transmission Company of Illinois.

II. PURPOSE OF TESTIMONY

Q. To what testimony or issues are you responding?

A. I am responding on behalf of Ameren Missouri ("Ameren Missouri" or "the Company") to the Direct Testimony of Claire M Eubanks on behalf of Missouri Public Services Commission.

I specifically respond to her discussion around transmission projects and the timing of those projects arising from the closure of Rush Island Energy Center.

Q. Ms. Eubanks expresses concerns with the transmissions projects what were required for the closure of the plant, including a concern regarding a project that was not necessitated by Rush Island's closure. What is her concern?

A. Ms. Eubanks notes that the Company is seeking a certificate of convenience and necessity ("CCN") for a new substation located in Central Missouri, the Cooper Substation (see File No. EA-2025-0088) and notes that in the CCN case it was indicated that the Cooper Substation would accommodate a new capacitor bank that is needed for system reinforcement due to Rush Island's retirement. She also correctly notes that the Rush Island retirement-driven capacitor bank is already installed at the existing Overton 161 kV/69kV substation. She therefore is apparently concerned that Ameren Missouri might be installing a second capacitor bank that is not needed, i.e., that a duplicated, unnecessary second capacitor bank is going to be installed at the Cooper substation.

Q. How do you respond to this concern?

A. There is only one capacitor bank, the one already installed at Overton. I believe information provided in the CCN case may have (understandably) led to the confusion. The capacitor bank installed at Overton was required by MISO's Attachment Y study due to the retirement of Rush Island. Under the federal court's orders, Ameren Missouri was required to close Rush Island by October, 2024. In order to timely install a capacitor bank in this area – which needed to be in service for reliability reasons by the time of Rush Island's retirement, the capacitor bank was installed at the existing Overton substation.

Q. What does the Cooper Substation have to do with the capacitor bank?

A. It had nothing to do with the capacitor bank at the time MISO determined that its installation was required or at the time it was installed at Overton. However, since the Rush Island Attachment Y study was completed, changes to the Overton substation are now necessitated by a MISO Generator Interconnection Agreement (No. GI-083). Those changes will require expansion of the Overton substation, which when the work is done will become only a 345 kV substation. This, in turn, will necessitate relocation of the existing 67 MVAR capacitor bank since it is designed for operation at 161kV.

Q. Why do the changes to Overton necessitate relocation to another substation?

A. As addressed in the CCN docket, the need for a new 161 kV substation arises from the age and condition of the 161 kV equipment at Overton, and a lack of available space at Overton given changes that will be made to it. Therefore, the Cooper substation, not Overton will, provide 161 kV support in the area. Cooper will be located less than 1,000 yards from Overton and thus the capacitor bank can effectively perform the same electrical and reliability function at Cooper as it does at Overton.

Q. Does Mr. Eubanks raise any other concerns in her direct testimony?

A. Yes. She expresses concerns about the cost of the four transmission projects dictated by the Rush Island Attachment Y study. Company witness Matt Michels will address her claims about a "break-even analysis" in his rebuttal testimony. However, I want to clarify the projects that were actually required by the Attachment Y study versus the higher-level transmission cost estimates used in the 2020 IRP for the IRP cases where Rush Island would retire, including a case that assumed a Rush Island retirement in 2024.

Q. Please explain.

A. The transmission project cost estimates in the 2020 IRP assumed that if Rush Island retired in 2024 (which is what actually happened) three static var compensators ("Statcoms") would be required plus a new transformer at the Wildwood substation. However, the Attachment Y study identified an additional bus-tie upgrade at the Rush Island substation and a voltage issue which necessitated the capacitor bank discussed earlier, which is installed at Overton. Consequently, the scope of the transmission work actually necessitated by Rush Island's retirement turned out to be greater than assumed at the time of the 2020 IRP. As Mr. Michel's rebuttal testimony discusses, the retirement versus retrofit analyses he conducted after the federal court's Rush Island order was affirmed by the appellate court used the 2020 IRP assumptions. It is therefore not at all surprising that the total cost of the projects necessitated by the Attachment Y study are higher than the lower end of the estimated range used for the 2020 IRP and the retirement/retrofit analysis since according to the Attachment Y analysis more transmission work needed to be done than was known at the time of the 2020 IRP.

Q. Why would the scope of the required work change in just a few years?

A. Ameren Missouri's transmission system, the Ameren Transmission System overall, and the entire transmission system under MISO's functional control are seeing large and rapid changes, due in part to the changing energy sources and now the large load requests from data centers and other loads. The Midwest has historically relied on local, fossil-based generation, which provided both a source of megawatts, but also a source of megavars for the voltage control of the grid. The grid has seen a significant amount of generation retirement, in particular fossil baseload units, and has replaced it largely with renewable, more remote based generation. This change required megawatts to travel further before being used, along routes that are now more

heavily used, resulting in more variable voltages with less system dynamic recovery. As each plant retires, the resultant flows redistribute amongst existing lines, which may require new transmission to be built, and often requires the replacement of the missing voltage support.

These changes are dynamic and occur more and more frequently. Thus, depending on the ever-changing state of the grid at the time a given retirement (or addition) is studied, the study could indicate that a given set of transmission upgrades are needed, yet if that same retirement (or addition) were studied a year or two or three later, it may indicate that a different set of transmission upgrades are needed. That is what happened between the 2019 timeframe, when we developed estimated transmission costs in Rush Island that were used in the 2020 IRP, assuming Rush Island retired in 2024, and 2022 when the Attachment Y study for Rush Island was performed.

Q. Ms. Eubanks discusses several other transmission projects that were to be built in order to meet local transmission planning parameters which would not be met without them once Rush Island retired. Were these projects deemed necessary as a part of the Attachment Y process?

A. No. These projects were identified as part of the Attachment Y analysis but actually arose from a North American Electric Reliability Corporation required local transmission planning ("NERC TPL") analysis that identified certain situations, such as in extreme weather conditions, when adverse conditions on certain segments of the Ameren Transmission System could exist. The attachment Y process did not mandate these projects because the Attachment Y process contains only a subset of the reliability standards required by a NERC TPL analysis. Notably, the MISO process does not contain any sensitivity analysis, which occurs under NERC TPL analysis. For the NERC TPL analysis, the Ameren Transmission System was studied under various scenarios without Rush Island including a scenario of extreme weather like Winter Storm Uri and

non-coincident peak loads on the Ameren system. The following projects were identified from these sensitivity studies.

These projects (the first three of which are all within the state of Illinois and no costs associated with them are reflected in Ameren Missouri's revenue requirements or rates) are as follows.

- **Reconductoring 345 kV Coffeen to Roxford transmission line in Illinois:** The reconductoring of this line is needed to address thermal overload from power moving west from Illinois into Missouri, during a winter storm sensitivity.
- **Install new shunts on the 138kV Neoga-Effingham 1 Northwest transmission line in Illinois:** Line was identified as a constraint under a winter storm sensitivity. This required hardware changes only on the line.
- **New 138kV transmission line from Beehive to Dupo Ferry in Illinois:** This line was identified during a summer sensitivity analysis where if the non-coincident peak loads are observed then there could be low voltages at Beehive substation. The mitigation was to build a 1mile line between Dupo Ferry and Beehive substations to mitigate the voltage concern. This project is completed and is currently in-service.
- **Re-tap CT's at Hannibal Substation in Missouri:** Finally, under the same winter sensitivity scenario, Spalding – Hannibal West 161 kV line and Hannibal West – Palmyra 161 kV lines located in Missouri needed a higher thermal rating to prevent an overload. The project used existing maintenance funding and involved retapping CTs at the 138kV Hannibal West substation to increase the thermal capability of the two 161 kV lines.

Q. Does this conclude your testimony?

A. Yes.

BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF MISSOURI

In the Matter of Union Electric Company	**)**	
d/b/a Ameren Missouri's Tariffs to Adjust	**)**	Case No. ER-2024-0319
Its Revenues for Electric Service.	**)**	

AFFIDAVIT OF JUSTIN DAVIES

STATE OF MISSOURI)
) ss
CITY OF ST. LOUIS)

Justin Davies being first duly sworn states:

My name is Justin Davies, and on my oath declare that I am of sound mind and lawful age; that I have prepared the foregoing *Rebuttal Testimony*; and further, under the penalty of perjury, that the same is true and correct to the best of my knowledge and belief.

/s/ Justin Davies
Justin Davies

Sworn to me this 14th day of January, 2025.