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Exhibit No. 108

Staff – Exhibit 108
Shawn Lange
Rebuttal
File No. EF-2024-0021

Exhibit No.:
Issue(s): Rush Island
Witness: Shawn E. Lange
Sponsoring Party: MoPSC Staff
Type of Exhibit: Rebuttal Testimony
Case No.: EF-2024-0021
Date Testimony Prepared: February 27, 2024

MISSOURI PUBLIC SERVICE COMMISSION
INDUSTRY ANALYSIS DIVISION
ENGINEERING ANALYSIS DEPARTMENT

REBUTTAL TESTIMONY

OF

SHAWN E. LANGE, P.E.

Union Electric Company d/b/a Ameren Missouri
Case No. EF-2024-0021

Jefferson City, Missouri
February 2024

1 **REBUTTAL TESTIMONY OF**

2 **SHAWN E. LANGE, P.E.**

3 **UNION ELECTRIC COMPANY d/b/a AMEREN MISSOURI**

4 **Case No. EF-2024-0021**

5 Q. Please state your name and business address.

6 A. My name is Shawn E. Lange, and my business address is Missouri Public
7 Service Commission, P.O. Box 360, Jefferson City, Missouri, 65102.

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

9 A. I am employed by the Missouri Public Service Commission (“Commission”) as
10 a Senior Professional Engineer in the Engineering Analysis Department of the Industrial
11 Analysis Division.

12 Q. Please describe your educational and work background.

13 A. Please see Schedule SEL-1.

14 Q. What is the purpose of your testimony?

15 A. The purpose of my rebuttal testimony is to respond to Ameren Missouri’s
16 witness Jim Williams on the necessary transmission upgrades needed for Rush Island
17 retirement.

18 **RUSH ISLAND ENERGY CENTER**

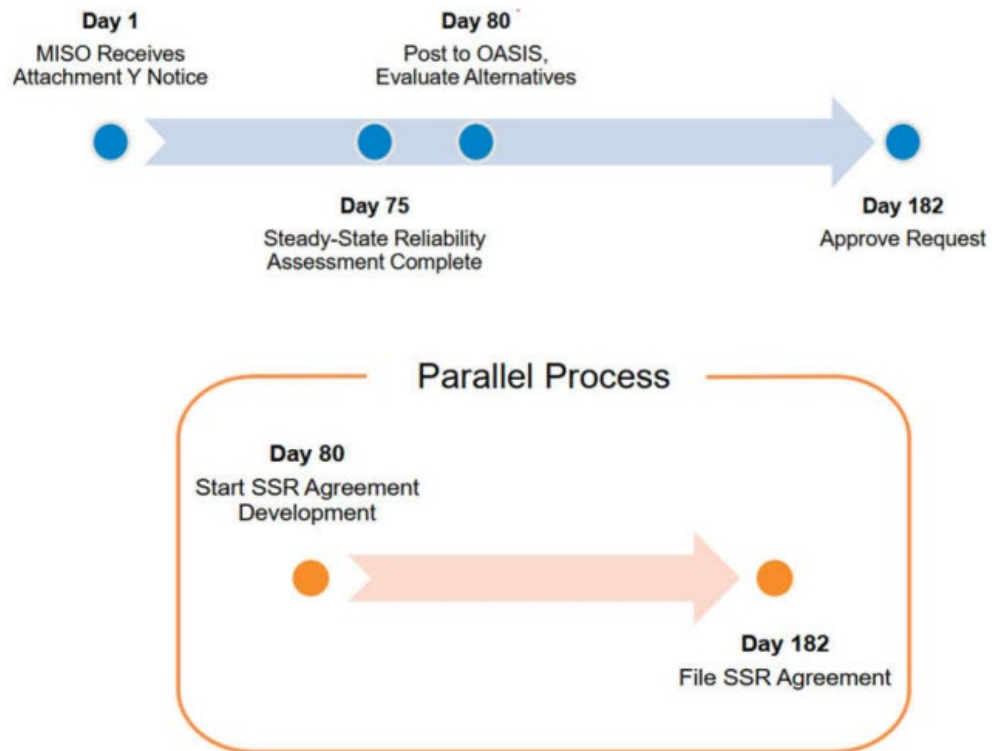
19 Q. Ameren Missouri witness Jim Williams mentions the attachment Y study,¹ is
20 there anything you would like to discuss about the attachment Y study?

21 A. Yes, I would like to briefly discuss the attachment Y study and the transmission
22 projects that are needed for grid reliability issues due to the retirement of the Rush Island
23 Energy Center.

24 Q. What is the attachment Y study?

¹ EF-20224-0021 Jim Williams Direct Pg. 4 lines 5-10.

1 A. MISO’s retirement process, Attachment Y, requires a 26-week notice period
2 (182 days). During this 26-week notice period, MISO will conduct a study (“Attachment Y
3 Study”) to determine whether all or a portion of the resource’s capacity is necessary to maintain
4 system reliability, such that system support resource (“SSR”)² status is justified. If so, and if
5 MISO cannot identify an SSR alternative that can be implemented prior to the retirement or
6 suspension effective date, then MISO and the market participant shall enter into an agreement
7 to ensure that the resource continues to operate, as needed.³ The figures below show the
8 MISO Attachment Y timeline:⁴



9

² Midcontinent Independent System Operator, Inc.’s (MISO) Open Access Transmission, Energy and Operating Reserve Markets Tariff (Tariff) defines SSR Units as “Generation Resources or Synchronous Condenser Units (SCUs) that have been identified in Attachment Y – Notification to this Tariff and are required by the Transmission Provider for reliability purposes, to be operated in accordance with the procedures described in Section 38.2.7 of this Tariff.” MISO FERC Electric Tariff, Module A, § 1.S “System Support Resource (SSR)” (39.0.0)

³ FERC Docket No. EL14-34-003, et al. ORDER ON REHEARING AND CLARIFICATION AND ORDER ON REFUND REPORT (Issued September 22, 2016) Pg. 2 Paragraph 2.

⁴ EO-2022-0215 Staff Initial Report Pg. 5 lines 2-13.

Rebuttal Testimony of
Shawn E. Lange, PE

1 Q. What were the results of the MISO Attachment Y study?

2 A. The attachment Y study showed that continued plant operations were required
3 beyond September of 2022, until additional specified transmission system upgrades were
4 placed into service. The following transmission upgrades need to be completed before the
5 Rush Island Energy Center can retire (the estimated completion timeline is also shown below):⁵

| Project | Estimated Completion Date |
|---|---|
| Installation of a Capacitor Bank at the Overton Substation to address voltage issues | Spring/Fall 2023 |
| Replacement of a Transformer at the Wildwood Substation in St. Louis County to address overload concerns | Spring 2024 |
| Upgrading of a bus bar tie position at a substation adjacent to Rush Island to address voltage issues | Spring/Fall 2023 |
| Installation of four (4) STATCOMs in the St. Louis Metropolitan area to provide reactive power support; installations to occur as equipment becomes available 2024-2025 | Final STATCOM Fall 2025, perhaps earlier |

6
7 Q. What is the cost of these upgrades?

8 A. In ER-2022-0337, the Overton Substation work was estimated to cost
9 ** [REDACTED] **. ⁶ The work at the Wildwood Substation was estimated to cost
10 ** [REDACTED] **. ⁷ The work at the Rush Island switchyard was estimated to cost
11 ** [REDACTED] **. ⁸ The work associated with all four (4) STATCOM units was estimated to
12 cost ** [REDACTED] **. ⁹ This resulted in an estimated total of ** [REDACTED] **. ¹⁰
13 Matt Michels, in this case, presented a breakeven analysis on the Rush Island retirement using

⁵ ER-2022-0337 Mark Birk Direct Pg. 7.
⁶ ER-2022-0337 Mark Birk Direct Pg. 8 line 13.
⁷ ER-2022-0337 Mark Birk Direct Pg. 8 line 14.
⁸ ER-2022-0337 Mark Birk Direct Pg. 8 line 14.
⁹ ER-2022-0337 Mark Birk Direct Pg. 8 line 15.
¹⁰ ER-2022-0337 Mark Birk Direct Pg. 8 line 15.

Rebuttal Testimony of
Shawn E. Lange, PE

1 an assumed ** [REDACTED] ** for the transmission upgrades associated with retiring
2 Rush Island.¹¹

3 Q. Have the transmission upgrades changed?

4 A. Yes. Ameren Missouri has added a fifth STATCOM. Ameren and MISO had
5 already identified the need to add a STATCOM at Bugle regardless of whether Rush Island
6 continues to operate or is converted to a synchronous condenser. Ameren had submitted the
7 project to the MISO Transmission Expansion Plan (MTEP) portal in September 2021, as a
8 voltage support project, after an enhanced study with higher resolution dynamic load models
9 identified the need for a reactive support device at Bugle. Separately, MISO had also discovered
10 the need for a voltage support device at Bugle during its voltage transfer analysis and had
11 requested that Ameren submit a project to resolve the issue. The project was not submitted as a
12 Baseline Reliability Project (BRP) as it had not been uncovered during a full annual assessment;
13 however, by 2022, it would have had its project classification altered to a BRP due to transient
14 voltage criteria violations. A synchronous condenser solution was evaluated at Bugle, but,
15 ultimately, not selected given that the potential addition of its fault current contribution would
16 push the ultimate fault current at Bugle to exceed the designed 63 kA limit. The project is
17 expected to be placed in service by June 1, 2025.¹²

18 Q. Has the total cost changed?

19 A. Yes. The total cost of all of the projects is expected currently expected to be
20 ** [REDACTED] **. ¹³ Future treatment of these costs is discussed in the rebuttal testimony
21 of Claire Eubanks PE.

¹¹ EF-2024-0021 Matt Michels Direct Pg. 4 lines 16-18.

¹² EF-2024-0021 Ameren Missouri Response to Staff DR 17 Cover Sheet Pgs. 2-3.

¹³ EF-2024-0021 Ameren Missouri Response to Staff DR 17 Cover Sheet Pg. 4.

Rebuttal Testimony of
Shawn E. Lange, PE

- 1 Q. Does this conclude your rebuttal testimony?
- 2 A. Yes, it does.

BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF MISSOURI

In the Matter of the Petition of Union Electric)
Company d/b/a Ameren Missouri for a)
Financing Order Authorizing the Issue of)
Securitized Utility Tariff Bonds for Energy)
Transition Costs related to Rush Island)
Energy Center

Case No. EF-2024-0021

AFFIDAVIT OF SHAWN E. LANGE, PE

STATE OF MISSOURI)
)
COUNTY OF COLE) ss.

COMES NOW SHAWN E. LANGE, PE, and on his oath declares that he is of sound mind and lawful age; that he contributed to the foregoing *Rebuttal Testimony of Shawn E. Lange, PE*; and that the same is true and correct according to her best knowledge and belief.

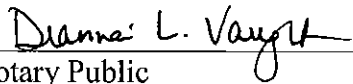
Further the Affiant sayeth not.


SHAWN E. LANGE, PE

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 21st day of February 2024.

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


Notary Public

CREDENTIALS AND CASE PARTICIPATION OF
SHAWN E. LANGE, PE

PRESENT POSITION:

I am a Professional Engineer in the Engineering Analysis Department, Industry Analysis Division, of the Missouri Public Service Commission.

EDUCATIONAL BACKGROUND AND WORK EXPERIENCE:

In December 2002, I received a Bachelor of Science Degree in Mechanical Engineering from the University of Missouri, at Rolla now known as the Missouri University of Science and Technology. I joined the Commission Staff in January 2005. I am a registered Professional Engineer in the State of Missouri and my license number is 2018000230.

TESTIMONY FILED:

| Case Number | Utility | Testimony | Issue |
|--------------------|---------------------------------------|------------------|-----------------------|
| ER-2005-0436 | Aquila Inc. | Direct | Weather Normalization |
| | | Rebuttal | Weather Normalization |
| | | Surrebuttal | Weather Normalization |
| ER-2006-0314 | Kansas City Power & Light Company | Direct | Weather Normalization |
| | | Rebuttal | Weather Normalization |
| ER-2006-0315 | Empire District Electric Company | Direct | Weather Normalization |
| | | Surrebuttal | Weather Normalization |
| ER-2007-0002 | Union Electric Company d/b/a AmerenUE | Direct | Weather Normalization |
| ER-2007-0004 | Aquila Inc. | Direct | Weather Normalization |
| ER-2007-0291 | Kansas City Power & Light Company | Staff Report | Weather Normalization |
| | | Rebuttal | Weather Normalization |
| ER-2008-0093 | Empire District Electric Company | Staff Report | Weather Normalization |
| ER-2008-0318 | Union Electric Company d/b/a AmerenUE | Staff Report | Weather Normalization |

| Case Number | Utility | Testimony | Issue |
|--------------------|--|------------------|--|
| ER-2009-0089 | Kansas City Power & Light Company | Staff Report | Net System Input |
| ER-2009-0090 | KCP&L Greater Missouri Operations Company | Staff Report | Net System Input |
| ER-2010-0036 | Union Electric Company d/b/a AmerenUE | Staff Report | Net System Input |
| ER-2010-0130 | Empire District Electric Company | Staff Report | Variable Fuel Costs |
| | | Surrebuttal | Variable Fuel Costs |
| ER-2010-0355 | Kansas City Power & Light Company | Staff Report | Variable Fuel Costs |
| ER-2010-0356 | KCP&L Greater Missouri Operations Company | Staff Report | Engineering Review-Sibley 3 SCR |
| ER-2011-0004 | Empire District Electric Company | Staff Report | Variable Fuel Costs |
| ER-2011-0028 | Union Electric Company d/b/a Ameren Missouri | Staff Report | Net System Input |
| ER-2012-0166 | Union Electric Company d/b/a Ameren Missouri | Staff Report | Weather Normalization |
| | | Surrebuttal | Weather Normalization Maryland Heights In-Service |
| ER-2012-0174 | Kansas City Power & Light Company | Staff Report | Weather Normalization Net System Input Variable Fuel Costs |
| | | Surrebuttal | Weather Normalization |
| ER-2012-0175 | KCP&L Greater Missouri Operations Company | Staff Report | Weather Normalization Net System Input |
| | | Surrebuttal | Weather Normalization |
| ER-2012-0345 | Empire District Electric Company | Rebuttal | Interim Rates |
| | | Staff Report | Weather Normalization |
| EC-2014-0223 | Noranda Aluminum v. Ameren Missouri | Rebuttal | Weather Normalization |
| EA-2014-0207 | Grain Belt Express CCN | Rebuttal | Certificates of Convenience/Feasibility Analysis |
| | | Surrebuttal | |

| Case Number | Utility | Testimony | Issue |
|--------------------|--|----------------------|--|
| ER-2014-0258 | Union Electric Company d/b/a Ameren Missouri | Staff Report | Net System Input Variable Fuel Costs |
| ER-2014-0351 | Empire District Electric Company | Staff Report | Net System Input Variable Fuel Costs |
| ER-2014-0370 | Kansas City Power & Light Company | Staff Report | Net System Input Variable Fuel Costs |
| | | True-up Direct | Variable Fuel Costs La Cygne In-service |
| EA-2015-0146 | ATXI CCN | Rebuttal | Certificates of Convenience/Feasibility Analysis |
| | | Surrebuttal | |
| ER-2016-0023 | Empire District Electric Company | Staff Report | Net System Input Variable Fuel Costs |
| | | Surrebuttal | Variable Fuel Costs |
| ER-2016-0179 | Union Electric Company d/b/a Ameren Missouri | Staff Report | Variable Fuel Costs |
| EA-2016-0385 | Grain Belt Express CCN | Rebuttal | Certificates of Convenience/Feasibility Analysis |
| | | Surrebuttal | |
| ER-2018-0145 | Kansas City Power & Light Company | Staff Report | Variable Fuel Costs Market Prices |
| | | Rebuttal | Variable Fuel Costs Market Prices |
| | | True-up Direct | Variable Fuel Costs Market Prices |
| EA-2018-0327 | ATXI CCN | Rebuttal | Certificates of Convenience/Feasibility Analysis |
| EA-2019-0021 | Ameren CCN | Staff Report | Certificates of Convenience/Feasibility Analysis |
| EA-2019-0010 | Empire District Electric Company CCN | Staff Report | Certificates of Convenience/Feasibility Analysis |
| EC-2020-0408 | MLA v. Grain Belt Complaint | Staff Recommendation | Formal Complaint |
| EA-2021-0167 | ATXI CCN | Staff Recommendation | Certificates of Convenience/Feasibility Analysis |

| Case Number | Utility | Testimony | Issue |
|--------------------|---|----------------------------|---|
| EA-2021-0087 | ATXI CCN | Staff Report | Certificates of Convenience/Feasibility Analysis |
| ER-2021-0240 | Union Electric Company d/b/a Ameren Missouri | Staff Report | Variable Fuel Costs Atchison wind farm Construction Audit and in-service review |
| | | Rebuttal | Atchison in-service and Variable Fuel Costs |
| | | True-up Direct | Variable Fuel Costs |
| ER-2021-0312 | Empire District Electric Company | Staff Report | Transmission and Distribution Investment |
| EA-2022-0043 | Evergy Metro and Evergy West Hawthorn Solar CCN | Staff Report | Certificates of Convenience/Feasibility Analysis |
| EA-2022-0099 | ATXI CCN | Staff Direct Testimony | Certificates of Convenience/Feasibility Analysis |
| EA-2022-0244 | Union Electric Company d/b/a Ameren Missouri | Staff Report | Certificates of Convenience/Feasibility Analysis |
| EA-2022-0245 | Union Electric Company d/b/a Ameren Missouri | Staff Rebuttal Testimony | Certificates of Convenience/Feasibility Analysis |
| ER-2022-0337 | Union Electric Company d/b/a Ameren Missouri | Direct Testimony | Variable fuel Costs |
| | | Rebuttal Testimony | Variable fuel Costs |
| | | Surrebuttal/True-up Direct | Variable fuel Costs |
| | | True-up Rebuttal | Variable fuel Costs |
| EA-2022-0328 | Evergy West | Staff Rebuttal Testimony | Certificates of Convenience/Feasibility Analysis |
| EA-2023-0017 | GrainBelt Express | Staff Rebuttal Testimony | Certificates of Convenience/Feasibility Analysis |

| Case Number | Utility | Testimony | Issue |
|--------------------|-----------------|------------------|--|
| EA-2023-0226 | Ameren Missouri | Staff Memo | Certificates of Convenience/Feasibility Analysis |
| ET-2023-0249 | Ameren Missouri | Staff Memo | Cogeneration and Net Metering rate |
| EA-2024-0286 | Ameren Missouri | Direct Testimony | Certificates of Convenience/Feasibility Analysis |