

Exhibit No.:
Issue(s): Planning Considerations
Witness: Dennis D. Kramer
Sponsoring Party: Ameren Transmission
Company of Illinois
Type of Exhibit: Direct Testimony
Case No.: EA-2017-0345
Date Testimony Prepared: September 15, 2017

MISSOURI PUBLIC SERVICE COMMISSION

CASE NO. EA-2017-0345

DIRECT TESTIMONY

OF

DENNIS D. KRAMER

ON

BEHALF OF

AMEREN TRANSMISSION COMPANY OF ILLINOIS

**St. Louis, Missouri
September, 2017**

NP

Table of Contents

I.	INTRODUCTION AND WITNESS QUALIFICATIONS.....	1
II.	PURPOSE AND SCOPE	4
III.	BACKGROUND OF MVP PROJECTS	7
IV.	BENEFITS OF THE MVP PORTFOLIO AND THE PROJECT	12
V.	MVP COSTS.....	22

DIRECT TESTIMONY

OF

DENNIS D. KRAMER

CASE NO. EA-2017-0345

1 **I. INTRODUCTION AND WITNESS QUALIFICATIONS**

2 **Q. Please state your name, business address and present position.**

3 A. My name is Dennis D. Kramer. I am currently the Senior Director of
4 Transmission Policy, Stakeholder Relations and Business Development at Ameren
5 Services Company (Ameren Services). Ameren Services provides various support
6 services to Ameren Corporation and its operating subsidiaries, including Ameren
7 Transmission Company of Illinois (ATXI). These services include engineering,
8 construction management, planning, finance, accounting, and legal services.

9 **Q. Please summarize your educational background and professional**
10 **experience.**

11 A. I graduated from Purdue University in 1978 with a Bachelor of Science
12 degree in Electrical Technology with concentrations in power systems and digital
13 electronics. I graduated from Tulane University in 1990 with a Master of Business
14 Administration degree with concentrations in strategic planning and marketing.

15 I have over 40 years of experience in the electric energy industry. In 1974, I was
16 employed by Public Service Indiana as a regional area operator in the Power Supply
17 organization, with responsibility for directing power transmission and distribution
18 activities. In 1978, I moved into an engineering position where I was responsible for

1 performing system load flow studies to assess the impact of system design modifications
2 on transmission capacity margins and system operations procedures. I also supported the
3 Supervisory Control and Data Acquisition (SCADA) Systems in the regional control
4 center. In 1979, I transferred to the Power Generation organization as an engineer at
5 Gibson fossil power plant, where I was responsible for supporting the instrumentation
6 and control systems and computer monitoring systems necessary for the safe and efficient
7 operation of the plant. In 1980, I transferred to the Marble Hill Plant, a 2,200 Megawatt
8 (MW) electric nuclear project, where I led the plant control instrumentation and control
9 engineering and plant computer engineering activities during construction and system
10 testing.

11 In 1984, I accepted a management position with Entergy Corporation at the
12 Waterford III 1,100 MW electric nuclear power plant. I managed engineers, programmers
13 and technicians performing the installation, testing and operational support of plant
14 control and monitoring systems. In 1988, I accepted the position of Manager, Marketing
15 Services in the retail and wholesale marketing organization of Entergy Corporation. I
16 managed analysts and researchers in creating and implementing customer research plans
17 and the development of preferred product/service portfolios.

18 In 1994, I accepted the position of Director, Technical Services with Unimar
19 Consulting Group Ltd. I directed engineers, analysts and researchers in conducting
20 research and developing portfolios of regulated and non-regulated products and services
21 for client companies including the majority of the top 100 electric utilities in North
22 America. In 1997, I accepted the position of Experienced Manager with the National
23 Energy Consulting Practice of Arthur Andersen. I managed numerous projects dedicated

1 to assisting clients in meeting electric deregulation requirements (with an emphasis in
2 Texas and California).

3 In 2002, I accepted the position of Senior Manager in the Energy Practice of
4 Bearingpoint Corporation. I performed numerous projects with energy clients in North
5 America to improve business processes, increase profitability and reduce operating costs
6 in the areas of power generation, transmission and distribution.

7 In 2005, I accepted the position of Transmission Policy Specialist with Ameren
8 Services. I assisted in transmission policy development and communication with
9 Regional Transmission Organization (RTO) stakeholders and the Midwest Independent
10 Transmission System Operator, Inc. (MISO)¹. In 2007, I was promoted to the position of
11 Supervisor, Transmission Policy, and in 2009, I was promoted to the position of Manager
12 of Transmission Policy and Planning.

13 In September 2014, I was promoted to Senior Director and was given the
14 additional responsibility for overall stakeholder communications and community and
15 public relations relating to the public processes for the routing of transmission assets. In
16 December 2016, I moved into my current position.

17 **Q. What are your duties and responsibilities in your present position?**

18 A. I am responsible for the development of transmission policy for the
19 transmission-owning companies served by Ameren Services, its communication to
20 stakeholders, and its eventual implementation through MISO and applicable regulatory
21 agencies. I also have responsibility for the overall stakeholder communications,

¹ In 2013 MISO changed its name to Midcontinent Independent System Operator, Inc.

1 community outreach, public relations, and public process for the routing and locating of
2 transmission assets.

3 **II. PURPOSE AND SCOPE**

4 **Q. Are you familiar with the Mark Twain Transmission Project?**

5 A. Yes. ATXI is proposing to construct what it calls the Mark Twain
6 Transmission Project (Mark Twain or the Project) in northeast Missouri. The Project
7 consists of a 345-kV electric transmission line that is largely co-located with an existing
8 Northeast Missouri Electric Power Cooperative (Northeast Power) transmission line² that
9 generally runs from near Palmyra³ in a westerly direction to near Kirksville. Near
10 Kirksville, the Project will connect to a new ATXI substation to be known as the Zachary
11 Substation, which will be interconnected to the existing Ameren Missouri 161 kV Adair
12 Substation, which is located immediately adjacent to the Zachary Substation site. Exiting
13 Zachary, the Project will then co-locate with an existing Union Electric Company d/b/a
14 Ameren Missouri (Ameren Missouri) transmission line that runs generally northward to a
15 connection point on the Missouri-Iowa border. At that point, the Project will connect
16 with the portion of the MISO Multi-Value Project (MVP) being constructed by
17 MidAmerican in Iowa⁴. The direct testimony of ATXI witness James (Jim) Jontry
18 provides more detailed information about the Project routing.

² The Northeast Power line is known as the Adair-South River 161-kV line.

³ Near Palmyra the Project will co-locate with an existing Ameren Missouri transmission line to connect to the Maywood switching station. This switching station is a part of ATXI's Illinois Rivers Project for which this Commission granted a Certificate of Public Convenience and Necessity in File No. EA-2015-0145. The Missouri portion of the Illinois Rivers Project was completed in October, 2016.

⁴ Discussed in further detail below.

1 In general, the Project is a portion of a larger portfolio of regional transmission
2 upgrades approved by MISO's Board of Directors pursuant to the provisions of its
3 Energy Markets and Operating Reserves Tariff (the Tariff), which has been approved by
4 the Federal Energy Regulatory Commission (FERC).

5 **Q. Is this the same project about which you testified in File No. EA-2015-**
6 **0146?**

7 A. Yes, with the only exception being that the specific route has been
8 adjusted so that it is almost entirely co-located with the Northeast Power and Ameren
9 Missouri lines mentioned above. From an electrical perspective, the project is the same.

10 **Q. What is the purpose of your testimony?**

11 A. The purpose of my testimony is to explain why the Project is necessary
12 and beneficial to the regional transmission system and why it benefits Missouri when it is
13 fully integrated in the grid.

14 **Q. Are you sponsoring any schedules in support of your direct**
15 **testimony?**

16 A. Yes. I am sponsoring the following schedules:

- 17 • **Schedule DDK-01**, a map depicting MISO's footprint
- 18 • **Schedule DDK-02**, a simplified electrical diagram of the existing
19 northeast Missouri 161-kV transmission supply system
- 20 • **Schedule DDK-03 (Confidential)**, summary results of an analysis of
21 the Northern Missouri electrical grid for certain NERC Category P
22 events

23 **Q. Will you be referring to any other documents?**

1 A. Yes. I will refer to several documents that are publicly available on the
2 MISO website (<https://www.misoenergy.org>):

- 3 • The MISO Transmission Expansion Plan 2011, referred to as
4 “MTEP11”;
- 5 • The MISO Multi Value Project Portfolio Results and Analysis report,
6 referred to as the “MVP Report”;
- 7 • The MISO MTEP14 MVP Triennial Review, referred to as “MVP
8 Triennial Review”;
- 9 • The MISO MTEP15 MVP Review, referred to as the "2015 MVP
10 Review"; and,
- 11 • The MISO MTEP16 MVP Review, referred to as the "2016 MVP
12 Review".

13 **Q. Please generally summarize why the Project is necessary and**
14 **beneficial for the regional transmission system.**

15 A. The Project is an integral part of a portfolio of Multi-Value Projects
16 (MVPs or the MVP Portfolio) that was approved by the MISO Board of Directors in
17 December 2011 as necessary to facilitate the delivery of renewable energy, resolve
18 numerous reliability issues, reduce transmission line losses, and provide economic and
19 efficiency benefits to customers within the MISO footprint.

20 **Q. Please generally summarize why the Project is beneficial to Missouri.**

21 A. When the Project is fully implemented, it will provide additional
22 transmission capacity to facilitate the delivery of renewable energy resources to Missouri,
23 market efficiency benefits as described in ATXI witness Dr. Todd Schatzki's direct

1 testimony, and improved reliability and voltage support to the transmission system in
2 northern Missouri, as I discuss below.

3 **III. BACKGROUND OF MVP PROJECTS**

4 **Q. You have testified that this Project is part of a portfolio of MVPs**
5 **approved by MISO in 2011. What is MISO?**

6 A. MISO is an independent, not-for-profit, and FERC-approved RTO
7 responsible for regional transmission planning, reliability assurance, and management of
8 competitive electricity markets across all or parts of 15 states, including Missouri, and the
9 Canadian province of Manitoba.⁵ MISO's regional area of operations ("footprint")
10 stretches from the Ohio-Indiana line in the east to eastern Montana in the west, and south
11 to New Orleans. **Schedule DDK-01** is a map depicting MISO's current footprint. MISO
12 serves as an essential link in the safe, cost-effective delivery of electric power across the
13 central one-third of the country.

14 As an RTO, MISO is responsible for operational oversight and functional control
15 of the Bulk Electric System (BES), the operation of transparent energy markets, and
16 regional and interregional transmission planning activities. MISO is responsible for
17 approving transmission service, new generation interconnections, and new transmission
18 interconnections to and within the MISO footprint, and for ensuring that the system is
19 planned to reliably and efficiently provide for existing and forecasted usage of the
20 transmission system.

21 **Q. Please describe the MISO Transmission Expansion Planning (MTEP)**
22 **process.**

⁵ In December 2011, MISO consisted of 12 states and the Canadian province of Manitoba.

1 A. The first step in the process occurs when Ameren Services, on behalf of
2 the MISO Transmission Owners it supports⁶ (and the other MISO Transmission Owners),
3 performs its annual analysis and planning required to maintain the reliability of
4 transmission systems for which Ameren Services provides support. Ameren Services
5 provides information to MISO, including plans for upgrades and additions to the
6 transmission system. MISO reviews the transmission plans from all MISO Transmission
7 Owners and applies their own analysis to identify synergies between plans and potentially
8 new solutions for identified system problems. MISO reviews and consolidates the
9 individual transmission plans of the MISO Transmission Owners and identifies potential
10 areas where additional benefit can be achieved through coordination of transmission
11 improvements.

12 Additionally, MISO performs targeted system studies, which seek to address
13 regional concerns and issues. The result of the MTEP process is a collection of projects
14 which are needed to address both regional and local system needs and provide desired
15 benefits.

16 **Q. You testified earlier that the Project is an MVP. What are MVPs?**

17 A. An MVP is a unique type of transmission project developed by MISO,
18 with stakeholder input, and approved by FERC. An MVP is a project that is evaluated
19 through the MISO MTEP process and determined as being a necessary component of a
20 portfolio of projects whose benefits are spread across the MISO footprint and that meet
21 certain criteria in the MISO Tariff.

22 **Q. What are those criteria?**

⁶Ameren Services provides support and transmission planning for the transmission systems of Ameren Missouri, Ameren Illinois Company d/b/a Ameren Illinois, and ATXI.

1 A. In order for a project to be classified as an MVP, it must meet at least one
2 of the following criteria (which appear in MISO's Tariff):

3 **Criterion 1**

4 A Multi Value Project must be developed through the transmission expansion
5 planning process for the purpose of enabling the Transmission System to reliably and
6 economically deliver energy in support of documented energy policy mandates or laws
7 that have been enacted or adopted through state or federal legislation or regulatory
8 requirement that directly or indirectly govern the minimum or maximum amount of
9 energy that can be generated by specific types of generation. The MVP must be shown to
10 enable the transmission system to deliver such energy in a manner that is more reliable
11 and/or more economic than it otherwise would be without the transmission upgrade.

12 **Criterion 2**

13 A Multi Value Project must provide multiple types of economic value across
14 multiple pricing zones with a Total MVP Benefit-to-Cost ratio of 1.0 or higher where the
15 Total MVP Benefit-to-Cost ratio is described in Section II.C.7 of this Attachment FF.
16 The reduction of production costs and the associated reduction of LMPs resulting from a
17 transmission congestion relief project are not additive and are considered a single type of
18 economic value.

1 **Criterion 3**

2 A Multi Value Project must address at least one Transmission Issue associated
3 with a projected violation of a NERC or Regional Entity standard and at least one
4 economic-based Transmission Issue that provides economic value across multiple pricing
5 zones. The project must generate total financially quantifiable benefits, including
6 quantifiable reliability benefits, in excess of the total project costs based on the definition
7 of financial benefits and Project Costs provided in Section II.C.7 of Attachment FF."

8 **Q. Please explain how the MVP Portfolio was developed.**

9 A. In 2008, MISO began the study process by undertaking a Regional
10 Generation Outlet Study (RGOS) to investigate how best to fulfill various Renewable
11 Portfolio Standards (RPS) requirements reliably and efficiently by accessing wind
12 resources located across the MISO footprint. The RGOS study was the first step in the
13 three-year detailed analysis of the transmission system that eventually led to the
14 determination that the transmission lines identified as part of the MVP Portfolio are
15 necessary to enable RPS mandates to be met at the lowest total delivered wholesale
16 energy cost. In addition, the MVP Portfolio was designed to enhance and complement the
17 performance of the existing grid to produce a more robust and efficient transmission
18 system. Ameren Services participated in the MISO RGOS and MVP studies over the
19 2008-2011 timeframe, assessing optimum transmission development to integrate the
20 renewable energy resources necessary to meet the states' renewable energy portfolio
21 standards and maximize the benefits that would ultimately be provided to Ameren
22 Missouri retail customers.

1 During the study process, MISO and the stakeholders developed a robust business
2 case for the MVPs, which demonstrated that not only will the MVP Portfolio reliably
3 enable RPS requirements to be met, but it will do so in a manner where its economic
4 benefits exceed its costs. While the study focused upon the states' RPS requirements, the
5 MVP Portfolio has widespread benefits beyond the delivery of wind and other renewable
6 energy. It will enhance system reliability and efficiency under a variety of different
7 generation build outs. It will also open markets to competition, reducing congestion and
8 spreading the benefits of low cost generation across the MISO footprint. The projects in
9 the 2011 MVP Portfolio were evaluated against MVP Criteria 1 and their ability to
10 reliably enable the renewable energy mandates of the MISO states.

11 MISO considered multiple future scenarios in the analysis to ensure that the
12 Project's expected benefits will be provided under a range of varying conditions. When
13 implemented, the MVP Portfolio is intended to achieve public policy goals, increase
14 market competition, deliver lower cost generation by reducing transmission system
15 congestion, and enhance the reliability of the regional transmission system under a
16 variety of possible future generation resource mixes.

17 As a result of this MTEP process, MISO's independent Board of Directors
18 approved in December 2011 several new transmission projects, including the portfolio of
19 17 MVPs. The MVP Portfolio is a key component of MTEP11. These 17 projects, taken
20 together, are intended to provide long-term, regional solutions for meeting state
21 renewable energy policies, improving the efficiency of wholesale energy markets and
22 addressing known reliability issues. Finally, the long-term nature of the transmission
23 needs intended to be met by the MVP Portfolio was an important factor in the planning

1 process and, as approved, ensures that the most efficient transmission portfolio is placed
2 in service.

3 **Q. How is the Mark Twain Project related to the projects making up the**
4 **MVP Portfolio that was approved in MTEP11?**

5 A. The Mark Twain Project is the name given by ATXI to all or portions of
6 two MVPs – Numbers 7 and 8 – that are being built by ATXI in Missouri. Specifically,
7 MVP 8 is the portion of the Project running from the Maywood Switching Station to the
8 new Zachary Substation. MVP 7 is the proposed line running from Zachary to Ottumwa,
9 Iowa, the Missouri portion of which is bundled together with MVP 8 as the Mark Twain
10 Transmission Project.

11 **Q. What is the anticipated in-service date for the Project?**

12 A. The Project's in-service date is anticipated to be late 2019.

13 **IV. BENEFITS OF THE MVP PORTFOLIO AND THE PROJECT**

14 **Q. What are the benefits of the Project?**

15 A. As an element of the MVP Portfolio, and as discussed by Dr. Schatzki in
16 his direct testimony, the Project will support a reduction in the wholesale cost of energy
17 delivery for consumers by enabling the delivery of low-cost generation to the load and
18 reducing congestion costs. It will also increase reliability in northeast Missouri, including
19 in the Kirksville area.

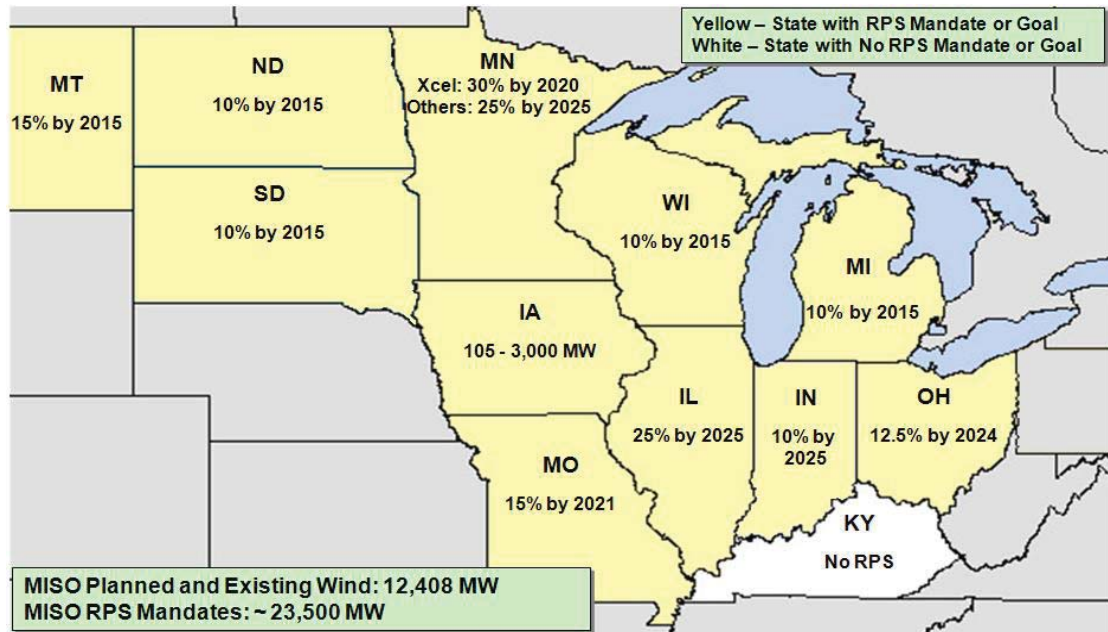
20 **Q. What was the justification for including the Project as a part of the**
21 **2011 MVP Portfolio?**

22 A. The Project was included in the MVP Portfolio based upon the following
23 benefits:

- 1 • The Project’s 345-kV lines from Ottumwa, Iowa to the Zachary
2 Substation (referred to in MTEP 11 as the Adair Substation) to
3 Maywood (referred to in MTEP 11 as the Palmyra Tap) and the 161-
4 kV connection between the Zachary Substation to Ameren Missouri's
5 existing Adair Substation will provide an outlet for wind generation in
6 the western region of MISO (which includes Missouri) to be delivered
7 to or in Missouri, as well as provide a path for renewable energy to
8 more densely populated load centers.
- 9 • In addition to providing a wind outlet, the new lines will provide
10 reliability benefits by addressing transmission issues in Northeast
11 Missouri, including low voltage concerns that could have arisen under
12 certain system conditions.

13 **Q. How does the increased access to wind generation enabled by the**
14 **Project assist states in meeting their renewable energy portfolio standards?**

15 A. As the MVP Report indicates, “The projects in the proposed Multi Value
16 Project portfolio were evaluated against Criterion 1, which requires the projects to
17 reliably or economically enable energy policy mandates.” MVP Report at 48. This was
18 particularly important because 11 of the 12 states in the MISO footprint at that time had
19 enacted RPS requirements or renewable energy goals that require or recommend that
20 various amounts of load be served with energy from renewable energy resources. Figure
21 3.1 of the MVP Report, set out below, depicts these standards:



1

2

Figure 3.1 RPS Mandates and goals within the MISO footprint

3

In its planning analysis, MISO anticipated that the wind resources throughout the MISO footprint would need to be relied upon to meet the RPS mandates.

5

One of the goals of the RGOS analysis was to design transmission portfolios that would enable RPS mandates to be met at the lowest delivered wholesale energy cost. To accomplish this, the RGOS analysis, with considerable stakeholder input, identified energy zones based upon considerations such as wind capacity and existing infrastructure (such as transmission and natural gas pipelines). The output of MISO's MVP study determined that the MVP Portfolio would enable the delivery of approximately 41 million MWh to help satisfy MISO state renewable portfolio mandates through 2026. These energy sources are assumed to be spread across the MISO footprint.

13

MISO has a tariff requirement to conduct a full review of the MVP Portfolio benefits on a triennial basis. Therefore, in 2014, MISO conducted its three-year review of the 2011 MVP Portfolio. MISO's analysis (the MTEP14 MVP Triennial Review) re-

15

1 demonstrated the Portfolio's ability to assist MISO states in meeting the state renewable
2 portfolio mandates. In fact, even though the RPS assumptions had not changed, MISO's
3 review demonstrated that the completed MVP Portfolio would enable even more
4 renewable energy – a total of 43 million MWh of renewable energy to MISO states
5 through 2028. In sum, the triennial review verified one of the important benefits of the
6 MVP Portfolio, which is that it provides these renewable energy sources to the MISO
7 states, including Missouri, to allow them to meet the RPS mandates.

8 **Q. You earlier mentioned that part of the MVP criteria, in addition to**
9 **meeting RPS mandates, was to develop a portfolio that was intended to support**
10 **public policy goals. With specific reference to Missouri, are there public policy**
11 **goals aside from Missouri's RPS that are supported by the Mark Twain Project?**

12 A. While not imposing a legal requirement on load serving entities in
13 Missouri, the delivery of renewable generation that the Mark Twain line (and the MVP
14 portfolio in general) enables and supports one of the recommendations in the *Missouri*
15 *Comprehensive State Energy Plan* issued by the Missouri Department of Economic
16 Development's Division of Energy. Specifically, the *State Energy Plan* recommended
17 that Missouri's RPS should be strengthened to require that 20 percent of annual retail
18 electricity sales be met through eligible renewable energy technologies by 2025. The
19 *State Energy Plan* also discussed the benefits of diversifying the state's energy portfolio,
20 which could occur from increased RPS standards or which could occur simply as the
21 result of increased access to competitive renewable energy as compared to more
22 traditional sources of generation, whether driven by relative cost or the demands of
23 customers.

1 **Q. How were the reliability concerns that will be addressed by the**
2 **Project identified?**

3 A. During the MVP planning process, Ameren Services identified known
4 reliability concerns that could potentially be addressed by the Project when it is fully
5 implemented and interconnected with the Ameren Missouri system, as well as connected
6 to the 345-kV transmission systems in Iowa and Illinois.⁷ In working with the MISO to
7 develop the Project, Ameren Services sought to design the Project to address known
8 reliability concerns where feasible. Ameren Services utilized its knowledge of load and
9 generation locations, as well as the transmission system topology, in attempting to
10 maximize the reliability benefits provided by the Project.

11 **Q. What are the reliability benefits for the MVPs comprising the Mark**
12 **Twain Project?**

13 ** [REDACTED]
14 [REDACTED]
15 [REDACTED]
16 [REDACTED]
17 [REDACTED]
18 [REDACTED]
19 [REDACTED]
20 [REDACTED]

⁷ The reliability benefits of the Project flow from the implementation of the entire Project, not from any single component.

⁸ NERC issued a revised Transmission Planning Standard in 2013, and now NERC Category P contingencies cover the same (and additional) transmission issues that were classified as Category C contingencies in the previous version of the Standard.

1 [REDACTED]

2 [REDACTED]

3 [REDACTED]**

4 **Q. Can you provide more details about the reliability issues in northeast**
5 **Missouri?**

6 A. ** [REDACTED]

7 [REDACTED]

8 [REDACTED]

9 [REDACTED]

10 [REDACTED]

11 [REDACTED]

12 [REDACTED]

13 [REDACTED]

14 [REDACTED]

15 [REDACTED]**

16 **Q. Are there limits on how low the system voltage can go without causing**
17 **problems?**

18 A. Yes. As I stated previously, the reliability issues in northeast Missouri are
19 primarily caused by low voltage conditions. Ameren Services applies the Ameren
20 Transmission Planning Criteria and Guidelines (the Criteria and Guidelines) when
21 analyzing the grid. The Criteria and Guidelines are developed in compliance with FERC

1 715, Part 4 TPRC⁹ requirements, are updated each year, submitted to FERC and
2 publically available on the MISO website.

3 The Criteria and Guidelines, Revised 3/15/2017, Section 2.7.3 System Study
4 Assumptions, paragraph 1, page 26, states the following: "In the course of study work,
5 should post-contingency transmission voltages in a general area drop to 90% of nominal
6 or below, closer examination is warranted to determine whether voltage collapse for such
7 contingency conditions is likely. Distribution bus voltages less than or equal to 90%
8 would indicate possible motor stalling (considering voltage drop of 5-7% on distribution
9 feeders). Transmission voltages of 85% is the level at which a voltage collapse is
10 essentially assured. Situations which show transmission voltages in the range of 86%-
11 89% in a steady state analysis carry significant risk for voltage collapse."

12 Q. ** [REDACTED]
13 [REDACTED]
14 [REDACTED]
15 [REDACTED]
16 [REDACTED]
17 [REDACTED]
18 [REDACTED]
19 [REDACTED]
20 [REDACTED]
21 [REDACTED]
22 [REDACTED]

⁹ Transmission Planning Reliability Criteria.

1 [REDACTED]

2 [REDACTED]

3 [REDACTED]

4 [REDACTED]

5 [REDACTED]

6 [REDACTED]**

7 **Q. Does Ameren Services apply this revised Standard when studying all**
8 **low-voltage events?**

9 A. Yes. The revised Standard and analysis method is used when studying
10 low-voltage events.

11 **Q. Does the Project fully address the low voltage issues that cause this**
12 **load to be at risk of loss?**

13 A. ** [REDACTED]

14 [REDACTED]

15 [REDACTED]

16 [REDACTED]**

17 **Q. Does the fact that the Project is going to be primarily co-located with**
18 **Northeast Power's 161-kV line from Palmyra to Zachary and the Ameren Missouri**
19 **161-kV line from Adair to the Iowa border impact the reliability benefits the Project**
20 **will provide?**

21 A. No, the reliability benefits of the Project are not impacted by the new
22 physical routing. The Project's electrical configuration and connections remain

1 unchanged and are the same as originally designed. Therefore, the Project will provide
2 the same reliability benefits as originally planned.

3 **Q. Has MISO analyzed the benefits provided by the MVP Portfolio**
4 **compared to the Portfolio costs?**

5 A. Yes. MISO analyzed the benefits and costs of the MVP Portfolio when it
6 was approved by the MISO Board of Directors in 2011. It should be noted that per FERC
7 Order ER10-1791-000, the MVPs were analyzed as a portfolio and not as individual
8 separate projects.

9 The analysis of the MVP Portfolio approved in MTEP11 revealed that the MVP
10 Portfolio resulted in total system-wide benefits ranging from 1.8 to 3.0 times its total cost
11 in 2011 dollars. When these system-wide benefits were evaluated for their distribution
12 within the MISO footprint, benefits to Missouri ranged from 1.8 to 3.2 times the costs.

13 **Q. When MISO conducted the MVP Triennial Review, what was the**
14 **benefit-cost ratio of the MVP Portfolio as a whole, and what was the benefit-cost**
15 **ratio for Missouri?**

16 A. When compared to the present value of the revenue requirements for the
17 MVP Portfolio, the MVP Triennial Review found that the Portfolio produces total system
18 wide benefits of between 2.6 to 3.9 times the costs on a present value basis, an increase
19 from the benefit cost ratio of 1.8 to 3.0 determined in the original Portfolio justification.
20 When these system-wide benefits were evaluated for their distribution within the MISO
21 footprint, benefits to Missouri had increased from its 2011 analysis, amounting to
22 between 2.3 and 3.3 times the costs.

1 **Q. Has MISO performed additional analysis of the MVPs since the**
2 **Triennial Review?**

3 A. Yes. In both 2015 and 2016 MISO performed a limited MVP analysis as
4 part of the MTEP process.

5 **Q. What were the results these analyses?**

6 A. MISO's 2015 MVP Review showed that projected MISO North¹⁰ and
7 Central region benefits provided by the MVP Portfolio are comparable to the MTEP11
8 analysis results. In the analysis the Portfolio produces total system wide benefits of
9 between 1.9 and 2.8 times the cost on a present value basis, which is almost identical to
10 the MTEP11 calculated benefits of 1.8 to 3.0. The benefits to Missouri ranged from 1.6
11 to 2.0. The reduction in calculated benefits is primarily due to lower assumed future
12 natural gas prices, but even at those lower natural gas prices, the ratios of benefits to costs
13 clearly shows that the benefits substantially outweigh the costs.

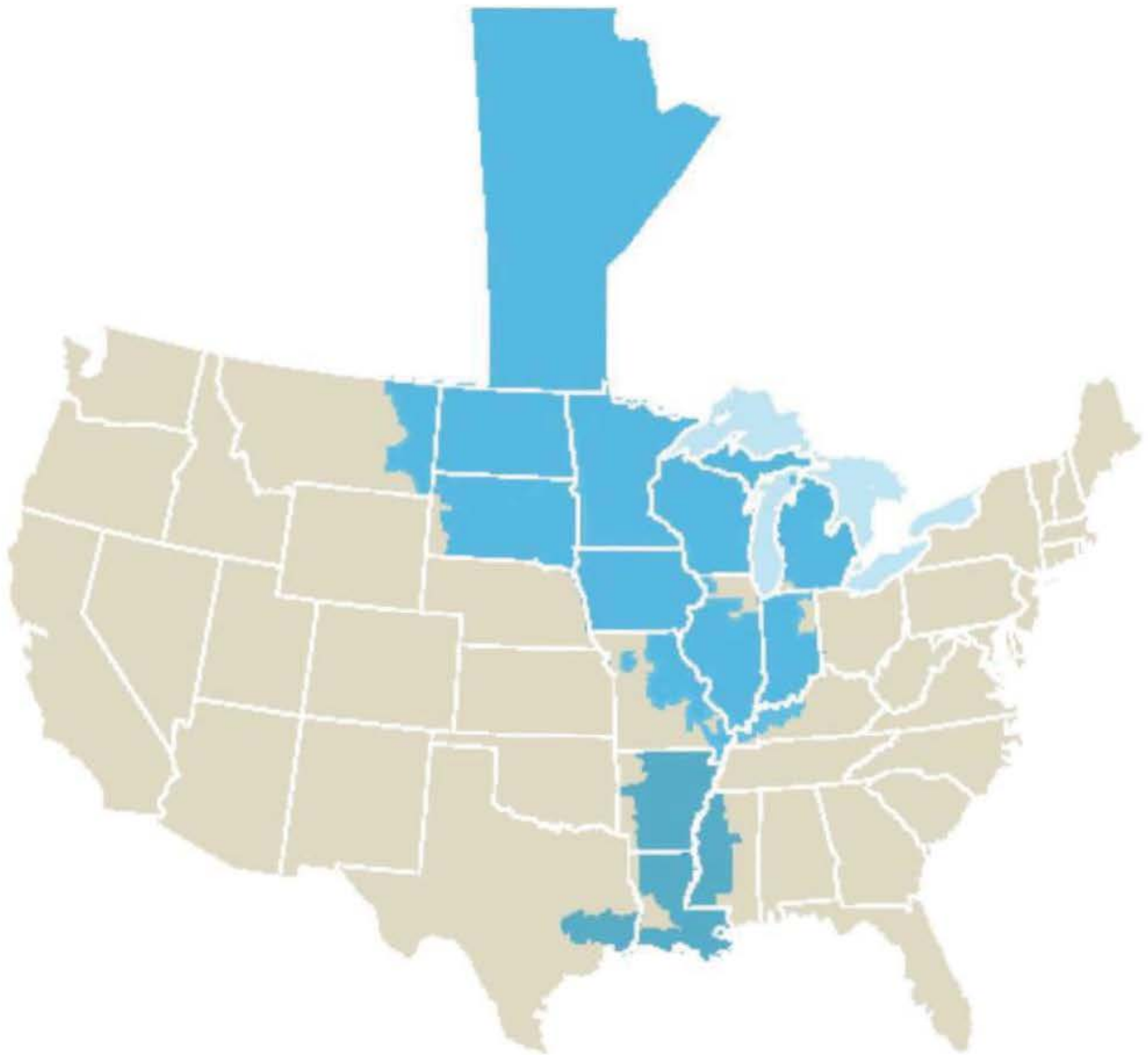
14 MISO's 2016 MVP Review shows that projected MISO North and Central region
15 benefits provided by the MVP Portfolio are comparable to the MTEP11 analysis results
16 and the 2015 MVP review. The 2016 MVP Review indicates the portfolio produces total
17 system wide benefits of between 2.0 and 2.7 times the cost on a present value basis. The
18 benefits to Missouri ranged from 1.6 to 2.0, which is identical to the 2015 MVP review.

19 The periodic reviews indicate that the thorough analysis of the MVP Portfolio that
20 was performed prior to their approval by the MISO Board of Directors has ensured the
21 Portfolio provides significant benefits under a wide range of future scenarios.

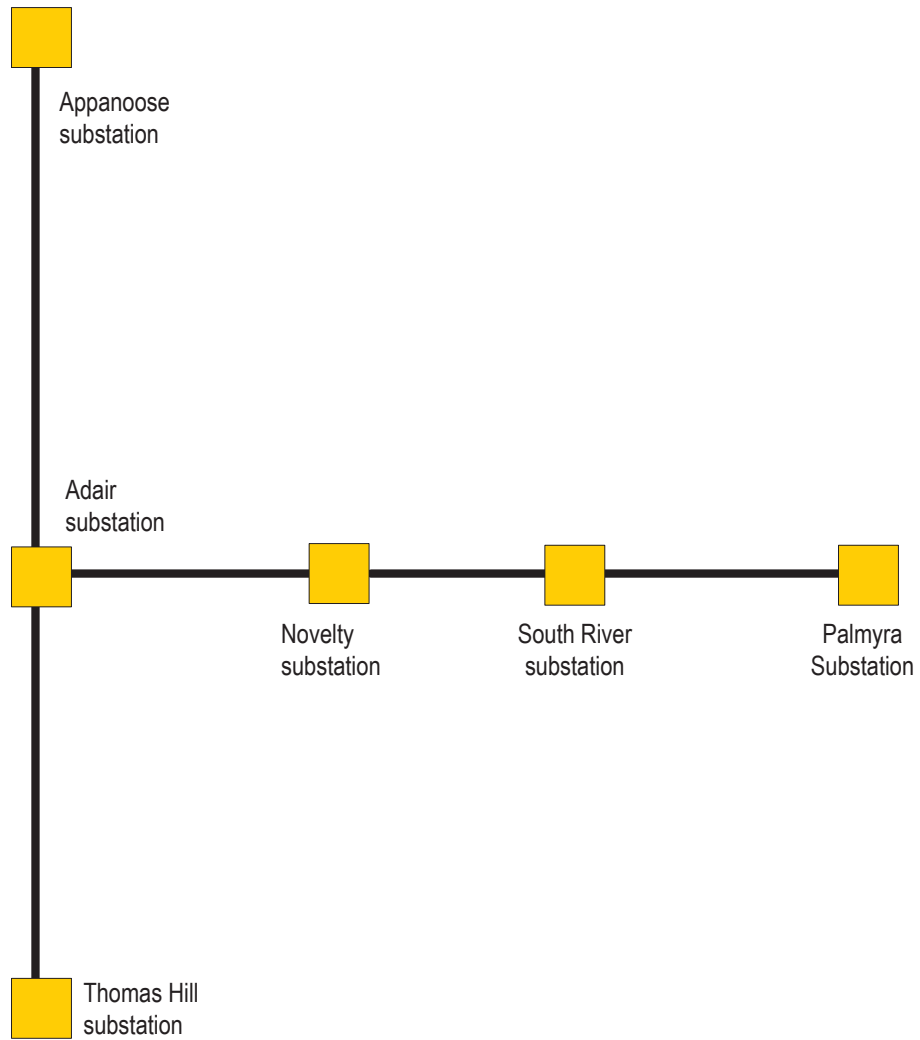
¹⁰ MISO North is MISO's footprint as it existed when the MVP portfolio was approved.

Schedule DDK-01

MISO Footprint Map



Northeast Missouri 161 kV supply system diagram



SCHEDULE DDK-03

IS CONFIDENTIAL

IN ITS ENTIRETY