# Exhibit No. 38

ATXI – Exhibit 38
Testimony of Adam Molitor filed on 7/16/24
Direct
File No. EA-2024-0302

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|---|---|
| Exhibit No.: | |
| Issue(s): | Line Design |
| Witness: | Adam Molitor |
| Type of Exhibit: | Direct Testimony |
| Sponsoring Party: | Ameren Transmission Company of Illinois |
| File No.: | EA-2024-0302 |
| Date Testimony Prepared: | July 16, 2024 |

**MISSOURI PUBLIC SERVICE COMMISSION**

**FILE NO. EA-2024-0302**

# DIRECT TESTIMONY

**OF**

**ADAM MOLITOR, P.E.**

**ON**

**BEHALF OF**

**AMEREN TRANSMISSION COMPANY OF ILLINOIS**

St. Louis, Missouri
July, 2024

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**DIRECT TESTIMONY**

**OF**

**ADAM J. MOLITOR, P.E.**

**FILE NO. EA-2024-0302**

## I. INTRODUCTION AND BACKGROUND

**Q. Please state your name and business address.**

A. My name is Adam J. Molitor. My business address is 1901 Chouteau Ave., St. Louis, Missouri 63103.

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

A. I am currently a Principal Engineer in the Transmission Line Design and Standards group for Ameren Services Company (Ameren Services).

**Q. What are your responsibilities as Transmission Line Design and Standards Engineer?**

A. My duties include designing transmission lines and developing standard drawings and documents for transmission line design, materials and construction, for Ameren Corporation's transmission-owning utilities—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). These duties include designing transmission lines, designing structures, and selecting hardware in accordance with National Electrical Safety Code (NESC) requirements; developing technical drawings; writing specifications and guidelines; preparing cost estimates; assisting with the management of project costs; and acting as the

technical lead to assist the project team throughout the selection of line routes, procurement, and construction of transmission expansion projects.

**Q. Please describe your educational and professional background.**

A. I graduated with a Bachelor of Science degree in Mechanical Engineering from the University of Missouri, Columbia in 2005. I have been an Engineer in Ameren Services Company's Transmission Line Design group since 2007. In the Transmission Line Design group, I have managed and designed projects on 138 kV, 161kV and 345 kV transmission lines. As of 2016, I develop standard documents, drawings, and processes for transmission line projects. In 2022, I was promoted to my current position as Principal Engineer within the Transmission Line Design and Standards group. I am a registered Professional Engineer in Illinois and Missouri.

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

A. No, I have not testified before the Missouri Public Service Commission (Commission), but I have testified before the Illinois Commerce Commission on behalf of Ameren Illinois.

## II. PURPOSE OF TESTIMONY AND SCHEDULES

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

A. My direct testimony will support ATXI's request for a Certificate of Convenience and Necessity (CCN) authorizing ATXI to construct, operate, and maintain transmission assets as part of the Northern Missouri Grid Transformation Program (Program) and certain other Commission approvals related to the Program. The facilities in ATXI's current application represent the first phase of the Program (Phase 1), and includes two projects: the Fairport-Denny-

Iowa/Missouri Border (FDIM) Project in Worth, Gentry, and DeKalb counties, and the Maywood-Mississippi River Crossing (MMRX) Project in Marion County (collectively, the Projects or Phase 1 Projects).[1]

My testimony focuses on describing the 345 kV transmission line-related elements of Phase 1. Specifically, I cover three topics. First, I explain the specific line work that will be undertaken to construct each of the line segments that collectively comprise the Phase 1 Projects. Second, I explain the design specifications for the Projects new transmission lines and support structures. Finally, I explain the right-of-way width that will be needed to accommodate the Projects' transmission lines.

**Q. Are you sponsoring any schedules with your direct testimony?**

A. Yes. I am sponsoring the following schedules:

- Schedule AM-D1 – Phase 1 Route Map, and
- Schedule AM-D2 – Typical Structure Drawings.

**Q. Are you providing any legal opinions in your direct testimony?**

A. No. Although I refer to several regulatory requirements, as I understand them, related to construction of the Projects, I am not an attorney and none of my testimony is intended to offer any legal opinions.

[1] The FDIM and MMRX Projects are the Missouri portions of 2 of the 18 multi-value projects (MVPs) included in the Long Range Transmission Planning (LRTP) Tranche 1 Portfolio approved by the Midcontinent Independent System Operator, Inc. (MISO), as discussed in the direct testimony of ATXI witness Mr. Jeff Dodd. The FDIM Project is part of MISO's Orient–Denny–Fairport MVP and the MMRX Project is part of MISO's Maywood-Meredosia MVP.

## III. PHASE 1 TRANSMISSION LINE WORK

### A. Generally

**Q. Please generally describe the Phase 1 Projects (FDIM and MMRX) transmission lines.**

A. ATXI is proposing to build approximately 53 miles of new 345 kV transmission line or circuit along its Proposed Route (Proposed Route). As I mentioned above, Phase 1 includes two projects. The FDIM Project consists of approximately 44 miles of greenfield, or new, construction for the new 345 kV transmission line. The MMRX Project consists of approximately 3 miles of greenfield construction to relocate an existing 345 kV transmission line (the existing structures and wire will be repurposed for the new MMRX 345 kV transmission circuit), routed along and adjacent to an existing ATXI transmission line corridor, and approximately 6 miles of brownfield construction to rebuild an existing single circuit Ameren Missouri 161 kV transmission line as a double-circuit 345kV/161kV transmission line. I will explain the scope of the line work on the Phase 1 Projects below in my testimony. Phase 1 is divided further into line segments and substations for ease of discussion, even though, as explained in detail by other ATXI witnesses, the facilities in Phase 1 are part of the overall Program, and is designed and intended to work together to realize the Program's full benefits.

**Phase 1 Line Segments:**

- Fairport-Denny-Iowa/Missouri Border Project (FDIM)
  - Fairport to Denny
  - Denny to the Iowa/Missouri Border

- Maywood to Mississippi River Project (MMRX)
  - Maywood to Palmyra[2]
  - Palmyra to the Mississippi River Crossing

**Phase 1 Substations:**

- New Denny Substation
- Existing Maywood Substation (upgrades or modifications)

I explain in detail the design and specifications for the Phase 1 Projects line segments, the location of which are shown at a high level on the route overview map attached to my testimony as Schedule AM-D1. The direct testimony of ATXI witness Mr. Eddings explains Phase 1's substation work in detail.

## B. FDIM – Fairport to Denny Line Segment

**Q. Please explain the scope of line work for this segment.**

A. The Fairport to Denny line segment of FDIM consists of approximately 1 mile of greenfield construction for the new 345 kV transmission line, going from Associated Electric Cooperative Incorporated's (AECI) existing Fairport Substation to the new ATXI Denny Substation. This segment is all located in Dekalb County. The majority of the line segment will be routed along NW Pleasant Road that runs east-west between the Denny and Fairport Substations. This segment is currently configured as a single circuit transmission line constructed on single circuit steel monopoles structures. However, a portion of this line segment could potentially be

[2] As I explain further below, this line segment goes to a point near and just north of Palmyra Substation but does not physically connect to the Palmyra Substation.

constructed using double circuit steel monopole structures to accommodate a second 345 kV circuit for the future Denny to Zachary line, which is part of the planned Denny-Zachary-Thomas Hill-Maywood (DZTM) Project that will make up Phase 2 of the Program. Please see the drawings in Schedule AM-D2 attached to my testimony for depictions of the typical structures being used on the Phase 1 Projects. This segment will require new 150-foot wide right-of-way.

## C. FDIM – Denny to Iowa/Missouri Border Line Segment

**Q. Please explain the scope of line work for this segment.**

A. The Denny to Iowa/Missouri Border line segment of FDIM consists of approximately 43 miles of new 345 kV single-circuit transmission line from the new ATXI Denny Substation to a point of interconnection at the Missouri-Iowa border.[3] This line segment is located in Dekalb, Gentry, and Worth Counties. This greenfield corridor will utilize single shaft steel poles for the structure type, as depicted on Schedule AM-D2. This segment will require new 150-foot wide right-of-way to accommodate the new 345 kV circuit.

## D. MMRX – Maywood to Palmyra Line Segment

**Q. Please explain the scope of line work for this segment.**

A. The Maywood to Palmyra line segment of MMRX consists of approximately 3 miles of a new single circuit 345kV transmission line from ATXI's existing Maywood Substation, going east to a point near the northside of the existing AECI Palmyra Substation (but will not physically connect to Palmyra), all located in Marion County. ATXI will "repurpose" a section of conductor on its existing double-circuit Maywood-Fabius 345 kV/Maywood-Palmyra

[3] From this point, it will connect with a new transmission line in Iowa to be constructed by the selected developer, from the state line to the Orient Substation.

345 kV transmission line, utilizing the Maywood-Fabius 345 kV circuit (MYWD-FABI-5088) for the new Maywood-Meredosia 345 kV circuit (MYWD-MDOS-4594). ATXI will construct a new single circuit, monopole transmission line to be used for the MYWD-FABI-5088 circuit, relocating it to a new corridor north of and adjacent to its existing Maywood-Fabius 345 kV/Maywood-Palmyra 345 kV transmission line corridor. This line segment will require new 100-foot wide easements, taking advantage of ATXI's existing easements to overlap the new 345 kV corridor to attain the required 150-foot wide right-of-way.

## E. MMRX – Palmyra to Mississippi River Crossing Line Segment

**Q. Please explain the scope of work for this segment.**

A. The Palmyra to Mississippi River Crossing line segment of MMRX consists of approximately 6 miles of brownfield construction, located in Marion County. ATXI will rebuild Ameren Missouri's existing single circuit Palmyra-Marblehead North 161 kV transmission line to a double-circuit line to co-locate with the proposed Maywood-Meredosia 345 kV circuit, starting from the point north of and near AECI's Palmyra Substation, going east approximately 6 miles to the Missouri/Illinois border river crossing. The rebuild will generally occur along the centerline of the existing Ameren Missouri transmission line, and will primarily be constructed on monopole steel support structures with the exception of dead-end locations or at angles greater than 15 degrees, which will utilize a two-pole design as I describe below and as shown in Schedule AM-D2. ATXI will obtain its own 150-foot easement rights, but plans on overlapping with Ameren Missouri's existing easements.

## IV. PHASE 1 TRANSMISSION LINE DESIGN

**Q. What are the design and operating voltages and frequency for the Phase 1 Projects' transmission lines?**

A. The new circuits for the Phase 1 Projects will be operated and designed at a voltage of 345 kV with 60 Hertz (Hz) frequency. The following design ratings, including the normal and emergency peak operating current ratings, for the 345 kV conductor are shown in the table below.

"Bundled" 2x954 Cardinal ACSS 54/7 Ratings

| | Max Design Temp (°F) | Summer Rating (A) | Winter Rating (A) |
|---|---|---|---|
| Normal: | 320 °F | 3070 A | 3398 A |
| Emergency: | 392 °F | 3500 A | 3764 A |

**Q. Please describe the conductor size, type, and spacing.**

A. All Phase 1 Projects' new 345 kV circuits will consist of bundled (two sub-conductors per phase, three phases total) 954 Cardinal ACSS 54/7, 18" horizontal bundle spacing.

**Q. Please describe the shield wires.**

A. The MMRX Project line segments and the Denny-Fairport line segment will have two fiber optic ground wires (OPGW) for the shield wires (which are generally used for substation relaying purposes). The Denny-Iowa/Missouri Border line segment will have two shield wires: one OPGW and one non-fiber 7 strand aluminum clad steel wire (7#7 Alumoweld).[4]

[4] If a double circuit configuration is ultimately used between Fairport to Denny line segment, the design will consist of two OPGW shield wires, instead of one OPGW shield wire and one 7#7 Alumoweld shield wire.

**Q. Please describe the support structures for the Phase 1 Projects' transmission lines and conductors.**

A. The new transmission lines for the Phase 1 Projects will be 345 kV, three phase, multi-grounded, 60 Hz, overhead transmission lines. The transmission lines will mostly use single-shaft steel poles, or monopoles, for the support structures. For the double circuit configurations, dead end structures and angles greater than 15 degrees will utilize a two-pole design with concrete foundations. To determine the optimal foundation design, a soil boring will be taken at the location of each new structure. Generally, it is expected that most tangent structures will be installed with direct embed foundations and that support angle and dead end structures will be installed on concrete foundations. The concrete foundations will typically be six to twelve feet in diameter and project out of the ground approximately two to three feet. Each embedment or foundation will be designed specific to that location per the geotechnical report for that location. Single circuit tangent structures for Fairport-Denny and Denny-Missouri/Iowa Border will utilize polymer braced post insulators, and the MMRX single circuit tangents and all angles and dead end structures will utilize steel arms and glass bell insulators. Double circuit transmission line segments will utilize steel arms and glass bell insulators.

**Q. What will be the height of and span between typical structures?**

A. The typical pole height will range from 90 feet to 150 feet above the top of the foundation. The typical distance between poles will vary between 750 feet and 1,000 feet. Schedule AM-D2 contains drawings of typical supporting structures that will be used for the Phase 1 Projects, including the heights and span ranges.

**Q. What are the loading design parameters for the lines?**

A. The lines will be designed in accordance with NESC requirements. Sections 250B, 250C and 250D of the NESC define the minimum loading conditions and thus the strength requirements applicable to the line and structures.

**Q. What are the designed line-to-ground and conductor-side clearances?**

A. A minimum vertical ground line clearance of 25 feet will be maintained for the new 345 kV circuits, per the NESC.

**Q. What about angle structures?**

A. Single circuit angle structures will be similar to the tangent structures but will be installed on a concrete foundation as opposed to being direct embed.

Double circuit lines with line angles greater than 15 degrees will consist of two separate steel poles, with each pole supporting an individual circuit. All angle structures will also be self-supporting steel poles with concrete foundations, without the need for guy wires. See Schedule AM-D2 for typical drawings of these structures.

**Q. Why were these structures selected?**

A. The Applicant selected weathering steel monopole structures for Phase 1 Projects for several reasons. These structures have a more compact footprint compared to some other types of structures, such as H-frames or lattice towers, and are generally less impactful as a result. Monopole structures can typically be constructed more easily and more quickly than other structure types, and design is fully customizable to the specific needs of a given structure at a particular location (soil borings will be retrieved to design the embedment or drilled pier

foundations specific to that location to ensure adequate and efficient embedment and foundation designs). They can also be designed to support multiple circuits and still be self-supporting, eliminating the need for multiple guy wires.

**Q. What is meant by "weathering" support structures?**

A. Generally, weathering steel, sometimes referred to as "corten steel," is composed of several steel alloys, which forms a rust patina over the steel after several years of exposure to the weather. Weathering refers to a chemical composition, which allows increased resistance to corrosion compared to other steels. The protective or controlled rust surface patina eliminates the need for painting or galvanizing.

**Q. What type of coating will the structures have?**

A. Above grade, weathering steel does not require the use of a protective coating. The protective rust surface repairs itself. The direct embed poles will have a ground sleeve (a thicker steel cross section) at the groundline to mitigate against corrosion. The ground line sleeve will extend 2 feet above grade and will extend 4 feet below grade. A two-part epoxy protective coating will be utilized on the bottom section to include the embedded part of the pole. The coating will be utilized 2 feet above the groundline and will extend at least 7 feet below groundline.

**Q. How will maintenance and repair of the structures be handled?**

A. Ameren Services on behalf of the ATXI will maintain a maintenance schedule for each structure, and while inspection frequency will be identical to that of galvanized poles, galvanized poles are expected to require painting between 20 to 40 years of service life, while weathering steel poles do not require painting.

**Q. Will the support structures also support any other lines or facilities, either initially or in the foreseeable future?**

A. Other than as previously described, the structures will not be utilized for other lines or facilities in the foreseeable future.

**Q. Other than the support structures and conductor, will there be any other facilities in the transmission line right-of-way?**

A. Yes. Along the Denny to Iowa/Missouri Border line segment, an underground fiber optic cable will be installed for supplemental substation relaying, as required by MISO in its request for proposals for the Fairport to Denny to IA/MO Border 345 kV competitive transmission project. The underground fiber will be installed at a depth of at least 40 inches in non-agricultural land and 60 inches in agricultural land. Fiber location markers will need to be placed every 500 feet designating the location of the fiber line. At locations where the underground fiber turns or splices are required, access boxes will be installed with the tops at ground level (per the current design there will be approximately 70 access boxes with an average spacing of 3,200 feet).

**Q. Will ATXI design the Project in accordance with all applicable regulatory standards?**

A. Yes. Ameren Services, on behalf of the Applicant, will design the Project in accordance with and to comply with all applicable regulatory requirements and standards, including, as I mentioned, the NESC requirements.

## V. PROJECT TRANSMISSION LINES RIGHT-OF-WAY

**Q. Generally, what right-of-way is needed for the Project's transmission lines?**

A. A 150-foot-wide right-of-way is needed for the Phase 1 Projects, from the conductors to the edge of the right-of-way, for operation and maintenance purposes. A 150-foot-wide right-of-way provides adequate clearance from the conductor to any building or obstructions on the edge of the right-of-way, and is the industry standard for 345 kV transmission lines, in accordance with NESC Rule 234C.1. This width will also enable ATXI to comply with its vegetation clearance requirements, as described in the Transmission Vegetation Management Project document FAC-003-1 that it has on file with the Federal Energy Regulatory Commission in response to North American Electric Reliability Corporation mandates.

## VI. CONCLUSION

**Q. Does this conclude your direct testimony?**

A. Yes.

**BEFORE THE PUBLIC SERVICE COMMISSION**
**OF THE STATE OF MISSOURI**

| | | |
|---|---|---|
| In the Matter of the Application of Ameren Transmission Company of Illinois for a Certificate of Convenience and Necessity under Section 393.170.1, RSMo and Approval to Transfer an Interest in Transmission Assets Under 393.190.1, RSMo relating to Transmission Investments in Northwest and Northeast Missouri. | ) ) ) ) ) ) ) ) | File No. EA-2024-0302 |

**AFFIDAVIT**

1. My name is Adam J. Molitor. I am a Principal Engineer in the Transmission Line Design and Standards group for Ameren Services Company, which is a subsidiary of Ameren Corporation and an affiliate of Ameren Transmission Company of Illinois, the Applicant in the above-captioned proceeding.

2. I have read the above and foregoing Direct Testimony and the statements contained therein are true and correct to the best of my information, knowledge, and belief.

3. I am authorized to make this statement on behalf of Ameren Transmission Company of Illinois.

4. Under penalty of perjury, I declare that the foregoing is true and correct to the best of my knowledge and belief.

*/s/ Adam J. Molitor*
Adam J. Molitor, P.E.
Principal Engineer in the Transmission Line Design and Standards group for Ameren Services Company

On behalf of Ameren Transmission Company of Illinois

Date: *July 16, 2024*