

P.E.

Exhibit No.:

Issue(s): Co-location / Use of
Existing Rights-of-Way

Witness: Jeffrey V. Hackman,

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

JEFFREY V. HACKMAN, P.E.

ON

BEHALF OF

AMEREN TRANSMISSION COMPANY OF ILLINOIS

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

Table of Contents

I.	INTRODUCTION AND WITNESS QUALIFICATIONS	1
II.	PURPOSE AND SCOPE.....	2
III.	THE CO-LOCATION AGREEMENTS.....	3

DIRECT TESTIMONY
OF
JEFFREY V. HACKMAN, P.E.
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 Jeffrey V. Hackman. My business address is 1901 Chouteau Avenue,
4 St. Louis, Missouri 63103. I am employed by Ameren Services Company (Ameren Services).

5 **Q. Please summarize your professional experience and educational background.**

6 A. I am the Senior Director of Transmission Operations & Technical Services for
7 Ameren Services. Ameren Services provides various corporate support services for the
8 operating subsidiaries owned by Ameren Corporation, including Ameren Transmission Company
9 of Illinois (ATXI), Union Electric Company d/b/a Ameren Missouri (Ameren Missouri), and
10 Ameren Illinois Company d/b/a Ameren Illinois. Ameren Services, on behalf of these three
11 companies, operates nearly 7,800 circuit miles of high-voltage transmission lines in Missouri and
12 Illinois. The companies are transmission-owning members and market participants in the
13 Midcontinent Independent System Operator, Inc. (MISO).

14 I joined Union Electric Company (now d/b/a Ameren Missouri) in 1980. While at
15 Ameren Missouri, I have held various positions in transmission planning, transmission substation
16 design, and electric and gas distribution engineering and operating, with increasing levels of
17 responsibility. I have authored, and co-authored, several technical papers in the area of high-
18 voltage insulation and flashover. In 2004, I transferred from division operations to Ameren
19 Services in the Transmission function, responsible for Operational Planning. In 2007, I was

1 promoted to Director of Transmission Operations. Since then, I have also been responsible for
2 Transmission Construction, Scheduling and Controls, Project Management, Risk and Capital
3 Management, Vegetation Management, Transmission Substation and Line Design, and
4 Transmission Construction and Maintenance. In 2016, I assumed my current role, in which I am
5 responsible for Transmission Operations, Balancing Authority Operations, Operational Planning,
6 and EMS (IT) systems and support including cyber protection and Application Development. I
7 also serve as a Project Sponsor for certain large transmission projects. I have sponsored
8 testimony in civil and regulatory cases, including cases before the Missouri Public Service
9 Commission (the Commission). I participate in several industry working groups and committees;
10 I have authored and co-authored articles in industry publications, and have served as a NERC
11 Standard Drafting team member.

12 I am a Professional Engineer (PE), having graduated from the University of Missouri at
13 Rolla in 1980 with a Bachelor of Science in Engineering. I also graduated from Webster
14 University in 1987 with a Master of Arts in Business Administration. I am a member of the
15 Missouri Society of Professional Engineers - St. Louis Chapter, having been recognized as its
16 “Outstanding Young Engineer of the Year” in 1992 and again in 2013 as the “Outstanding
17 Professional Engineer in Industry”. I am also a Senior Member of the Institute of Electrical and
18 Electronics Engineers.

19 **II. PURPOSE AND SCOPE**

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

21 A. The purpose of my testimony is to discuss ATXI’s intent to co-locate the vast
22 majority of the Mark Twain Transmission Project (the Project) along existing Ameren Missouri
23 and Northeast Missouri Electric Power Cooperative (Northeast Power) transmission line

1 corridors. In particular, I evaluate co-location in the context of the testimony I provided in Case
2 No. EA-2015-0146. ATXI witnesses Shawn Schukar and James (Jim) Jontry provide additional
3 background on ATXI's decision to pursue co-location in their respective pieces of direct
4 testimony.

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

6 A. No.

7 **III. THE CO-LOCATION AGREEMENTS**

8 **Q. Do you understand that ATXI now intends to co-locate the Project almost**
9 **entirely along existing transmission line corridors?**

10 A. Yes. My understanding is consistent with the revised Project descriptions
11 provided by ATXI witnesses Shawn Schukar and Jim Jontry. Specifically, I understand that the
12 Project will generally be co-located with Northeast Power transmission assets between Palmyra
13 and Kirksville and with Ameren Missouri transmission assets between Kirksville and the Iowa
14 border.

15 **Q. Did you testify on the topic of co-location previously?**

16 A. That depends on the definition of "co-location". In Case No. EA-2015-0146, I
17 provided testimony that largely focused on the topic of "paralleling" existing transmission lines.
18 Although there are several different ways in which one can parallel a transmission line (by using
19 overlapping, adjoining, or offsetting rights-of-way), the concept of paralleling, as discussed in
20 my previous testimony, was premised on the notion that the existing structures for the other
21 transmission line(s) would remain, and that the new structures for the Project would be
22 constructed independently, parallel to the existing ones.

1 **Q. How does this differ from the concept of co-location, as is now being**
2 **proposed by ATXI?**

3 A. In short, it's the difference between one set of poles and two. As described by
4 ATXI witnesses Schukar and Jontry, ATXI has reached agreements with Northeast Power and
5 Ameren Missouri to co-locate nearly 100% of the Project on existing transmission corridors.
6 "Co-locate", as is used in this context, means actually removing the existing lines and
7 constructing dual circuit lines in their place. In industry, this is commonly called "double-circuit"
8 construction.

9 **Q. Does this distinction make a difference from a reliability perspective?**

10 A. It certainly can. We try to limit the extent to which transmission lines are subject
11 to "common mode failure." Common mode failure results when one or more events cause
12 coincident failures in two or more systems (here, transmission lines), which, in turn, lead to
13 additional failures on the related system(s). One of the main causes of common mode failure
14 that Ameren experiences is wind-blown debris. One advantage of co-locating versus paralleling
15 is that there is no second set of poles that can be used as debris to contact the first. Simply put,
16 there is less "stuff" in the transmission corridor. I was, and am, not concerned about the
17 independent failure of ATXI's steel monopole facilities given the design parameters and safety
18 margins that govern them. However, paralleling the existing Ameren Missouri or Northeast
19 Power lines would have placed the Project next to a significant number of wooden H-frame
20 poles. Failure of these adjacent facilities, say during a significant weather event, posed a risk to
21 ATXI's facilities, just as trees would if left in close proximity to the new circuit.

22 **Q. In your previous testimony, you questioned the extent to which other**
23 **transmission providers in Northeast Missouri had the right to allow ATXI to use their**

1 **rights-of-way for purposes of the Project. Isn't that statement inconsistent with ATXI's**
2 **revised proposal?**

3 A. No. As discussed by ATXI witness Douglas (Doug) Brown, ATXI is going to
4 take advantage of existing transmission corridors, but is not going to "use" Ameren Missouri's or
5 Northeast Power's legal rights (easements) for purposes of permanently placing Project facilities.
6 In other words, we're not going to be seeking an assignment of rights. ATXI intends to obtain
7 independent real estate rights sufficient to install, maintain, inspect, patrol, remove vegetation,
8 and operate the ATXI facilities associated with the Project. The Ameren Missouri and Northeast
9 Power facilities are, or will be, covered by separate legal agreements between landowners and
10 those entities.

11 **Q. Is that what you meant when you indicated in your previous testimony that**
12 **ATXI must have its own right-of-way for construction, operation, maintenance and safety?**

13 A. Yes. I didn't mean that ATXI must necessarily have its own corridor. I meant that
14 ATXI must, for a number of reasons, obtain its own real estate rights, including the standard
15 terms and conditions that come along with those rights. For a further discussion of the easement
16 acquisition process, please see the direct testimony of ATXI witness Doug Brown.

17 **Q. In your previous testimony, you indicated that siting one line too close to**
18 **another (in the case of installing two parallel lines with less than 150 feet of separation)**
19 **could increase electromagnetic field (EMF) levels. Is this also the case with co-located**
20 **lines?**

21 A. Not necessarily. Interestingly enough, intentionally placing opposite conductor
22 phases in the same plane can lead to some cancelation of the fields. Initial calculations confirm
23 that there will be places along the line where co-locating will actually reduce the total amount of

1 EMF at the edge of the right-of-way as compared to a single 345-kV line or even the existing
2 161-kV lines. Although somewhat counterintuitive, two co-located lines can actually induce less
3 EMF than one independent circuit given the phase-cancellation effect.

4 **Q. From an operations and maintenance standpoint, are there significant**
5 **differences in the practical implications of operating and maintaining a parallel line versus**
6 **a double-circuited line?**

7 A. Not really, or at least not at these voltages. I spoke in my previous testimony
8 about how in the case of parallel lines, that unless there is sufficient separation between the lines,
9 that it may be necessary to take one line out of operation while servicing the other. The same is
10 generally true in the case of co-located lines, or at least those of the voltages associated with the
11 Project. For safety reasons, ATXI would typically de-energize its circuit to allow Northeast
12 Power or Ameren Missouri to perform work on theirs, and vice versa. In this regard, co-locating
13 does carry many of the same practical implications as paralleling. The Joint-Use Agreements
14 that are attached to Shawn Schukar's direct testimony as Schedules SES-01 (Confidential) and
15 SES-02 (Confidential), do require the parties to work together to perform any required work in a
16 safe and reliable manner.

17 **Q. In Case No. EA-2015-0146, weren't you asked in discovery about problems**
18 **that might arise if the Project was co-located with existing 161-kV lines in the area?**

19 A. Yes. I was asked by Staff to explain what issues or problems might arise as a
20 result of paralleling or co-location. I responded in part by indicating that the existing
21 transmission line corridors are not wide enough to accommodate construction of the Project
22 without taking the existing lines out of service, and that as a result, further studies would have to
23 be conducted to ensure that reliability could be maintained.

1 **Q. Regarding construction, does this continue to be the case?**

2 A. Yes. Given the voltages of the lines at issue, ATXI will not be able to perform
3 many construction activities on the new line while the existing lines are energized. Take for
4 example the drilling of foundations. Given the size of the rigs that will be used, in most
5 instances drilling cannot safely be conducted adjacent to an energized line of the voltages at
6 issue here. As a result, the parties will have to work closely to coordinate construction and
7 outages. And they already are.

8 ATXI is already working closely with Northeast Power and Ameren Missouri to
9 coordinate outages in a responsible manner. And we continue to examine the best way to
10 maximize our outage window(s) given regional load demands and conditions. We also know
11 that given the way the Northeast Power line is segmented (with three substations between
12 Palmyra and Kirksville) the physical and electrical configurations will present both benefits and
13 challenges. Needless to say, the parties continue to examine the best way to integrate the Project
14 into the regional grid in a safe and responsible manner, consistent with applicable any
15 regulations and good utility practice.

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

17 A. Yes, it does.

**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 Public)
 Convenience and Necessity Authorizing it to Construct,)
 Install, Own, Operate, Maintain and Otherwise Control)
 and Manage a 345-kV) File No. EA-2017-0345
 Electric Transmission Line from Palmyra, Missouri, to)
 the Iowa Border and an Associated Substation Near)
 Kirksville, Missouri.)

AFFIDAVIT OF JEFFREY V. HACKMAN

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

Jeffrey V. Hackman, being first duly sworn on his oath, states:

1. My name is Jeffrey V. Hackman. I work in the City of St. Louis, Missouri, and I am employed by Ameren Services Company as Senior Director of Transmission Operations and Technical Services.

2. Attached hereto and made a part hereof for all purposes is my Direct Testimony on behalf of Ameren Transmission Company of Illinois consisting of 7 pages, and Schedule(s) N/A , all of which have been prepared in written form for introduction into evidence in the above-referenced docket.

3. I hereby swear and affirm that my answers contained in the attached testimony to the questions therein propounded are true and correct.

 Jeffrey V. Hackman
 Jeffrey V. Hackman

Subscribed and sworn to before me this 8th day of September, 2017.

 Cathleen A. Dehne
 Notary Public

My commission expires: March 7, 2021

