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Issue(s): Parallel/Use of Existing
Rights-of-Way
Witness: Jeffrey V. Hackman, P.E.
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Sponsoring Party: Ameren Transmission Company
of Illinois
File No.: EA-2015-0146
Date Testimony Prepared: November 16, 2015

MISSOURI PUBLIC SERVICE COMMISSION

File No. EA-2015-0146

SURREBUTTAL TESTIMONY

OF

JEFFREY V. HACKMAN, P.E.

ON

BEHALF OF

AMEREN TRANSMISSION COMPANY OF ILLINOIS

St. Louis, Missouri
November, 2015

ATX1 Exhibit No. 11
Date 1/25/16 Reporter JL
File No. EA-2015-0146

TABLE OF CONTENTS

I.	INTRODUCTION AND WITNESS QUALIFICATIONS	1
II.	PURPOSE AND SCOPE.....	1
III.	THE USE OF EXISTING TRANSMISSION LINE RIGHTS-OF-WAY	1
A.	Use of existing rights-of-way.....	2
Q.	Does ATXI have any existing rights-of-way that it can use?	2
B.	“Paralleling” Transmission Lines	3

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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 present position is Senior Director of
4 Transmission Project Management and Construction for Ameren Services Company
5 (“AMS”), located at 1901 Chouteau Avenue, St. Louis, Missouri 63166.

6 **II. PURPOSE AND SCOPE**

7 **Q. What is the purpose of your rebuttal testimony?**

8 A. The purpose of my testimony is to address issues that have arisen regarding
9 the routing of the transmission line that is the subject of this case, and in particular, what
10 appear to be suggestions that the line should simply use existing transmission line rights-of-
11 way or otherwise parallel other transmission lines in Northeast Missouri. Specifically, the
12 comments referred to in Staff witness Natelle Dietrich’s rebuttal testimony, and similar
13 public testimony given at the Commission’s local public hearings in this case, appear to
14 suggest that use of existing rights-of-way or paralleling existing transmission lines is a viable
15 option for the route of this line. The Staff has also sent us data requests on the same topics.
16 As discussed below, these are not viable options.

17 **III. THE USE OF EXISTING TRANSMISSION LINE RIGHTS-OF-WAY**

18 **Q. Is it clear what alternatives are being suggested?**

19 A. I am not aware of any specific suggestions as to an alternative route, so it is
20 not entirely clear if the contention is that existing rights-of-way should be used without

1 obtaining new right-of-way, or whether the contention is that existing transmission lines
2 should be paralleled, or what that would mean in terms of precise location. It is not clear to
3 me, in suggesting ATXI use existing transmission line rights-of-way or otherwise parallel
4 such lines, that those who have suggested this anticipate precisely where the 345 kV
5 transmission line proposed in this proceeding would be in relation to those existing
6 transmission lines, or even which transmission lines they refer to.

7 **A. Use of Existing Rights-of-Way**

8 **Q. Does ATXI have any existing rights-of-way that it can use?**

9 A. No. To the extent that there are other transmission lines in Northeast
10 Missouri, they are all owned by another transmission provider, and as I understand it they
11 have no legal obligation or even the right to allow ATXI to use their rights for ATXI's line.
12 More importantly, it is not possible to use existing rights-of-way in any event because ATXI
13 must have its own 150-foot wide (for the 345-kV line) right-of-way for construction,
14 operation, maintenance and safety reasons.

15 **Q. Please explain those construction, operation, maintenance and safety**
16 **reasons.**

17 A. As defined in more detail later in my testimony, the ATXI conductors are
18 affected by mechanical loads, e.g., ice and wind, and thus occupy varying locations in space.
19 The 150-foot wide corridor ensures that no other facility can get close enough to interfere
20 with the reliability of the proposed line and makes sure that these energized facilities do not
21 get close enough to anything else to endanger safety. In addition to these physical separation
22 requirements, the magnetic and electric fields that are associated with these lines can induce

1 electromagnetic fields in other objects, including other transmission circuits. The 150-foot
2 wide corridor ensures that the field levels at the edge of the ROW do not pose such concerns.

3 **B. "Paralleling" Transmission Lines**

4 **Q. Please explain what it means to "parallel" transmission lines.**

5 A. To "parallel" transmission lines means to locate them on parallel rights-of-
6 way. In other words, separate structures support each circuit; in this case, ATXI's
7 transmission line and the other transmission provider's transmission line. For the Mark
8 Twain Project ("Project"), this would mean existing structures for the other transmission
9 line(s) would remain, and new structures for the Project would be constructed independently,
10 parallel to the existing structures.

11 **Q. Do parallel transmission lines require less rights-of-way?**

12 A. Not necessarily. There are three basic variations of the rights-of-way used for
13 parallel transmission lines: (1) overlapping rights-of-way, (2) adjoining rights-of-way, and
14 (3) offset rights-of-way.

15 In the case of overlapping rights-of-way, a utility tries to use some of an existing
16 right-of-way for the purposes of the new line. For instance, if the utility had an existing 100-
17 foot right-of-way, and if the new line had a nominal 150-foot right-of-way requirement, the
18 utility might consider if 10 feet of the existing right-of-way could be used for both lines, thus
19 requiring an additional easement of only 140 feet. This is most common when an existing
20 right-of-way is wider than nominal. However, for the case I described, the movement of the
21 wires must accommodate the reduced spacing between structures, which would increase the
22 number of poles that would have to be used. Increasing the number of poles not only
23 substantially increases costs, but it creates more impact on the underlying lands because for

1 every additional pole we must pour an additional foundation and engage in the construction
2 activities on the land associated with pouring the foundation and erecting the pole.

3 Additionally, there is usually a dramatic reliability reduction in that the structures are
4 very close and constitute a real and immediate threat to each other. Also, local weather
5 events and wind-blown debris or objects are likely to cause faults on both lines.

6 In the case of adjoining rights-of-way, the utility would abut the new right-of-way to
7 the existing right-of-way without separation. Thus, in my example, the old line right-of-way
8 of 100 feet would abut the new 150-foot right-of-way for the new circuit, resulting in an
9 unbroken 250-foot wide utility easement. As with overlapping rights-of-way, the proximity
10 of the circuits' structures to each other and the likelihood of local weather and wind-blown
11 debris and other objects is still a concern.

12 In the case of offset rights-of-way, the lines parallel each other, but the rights-of-way
13 do not touch. In other words, there is some width of land between the two easements. This
14 separation increases the reliability, but it effectively increases the overall width of the now
15 larger transmission line corridor.

16 **Q. Does paralleling transmission lines reduce the cost of constructing new**
17 **lines?**

18 A. Practically, no. In the case of overlapping rights-of-way, there is only a slight
19 reduction in the amount of right-of-way that must be purchased. However, there are no
20 existing rights-of-way with extra width for consideration for this Project. Regardless, as
21 mentioned, the movement of the conductors often limits the practical application of using
22 overlapping rights-of-way.

1 **Q. Does paralleling transmission lines reduce the costs associated with their**
2 **ongoing maintenance and repair?**

3 A. No. The practical reality is that, if the circuits are close to each other, both
4 circuits may have to be taken out of service in order to do maintenance. Then overtime
5 charges must be incurred and/or specialized equipment must be brought in because the time
6 to repair a line must be kept to an absolute minimum. Additionally, it becomes very
7 complicated to coordinate outages for transmission lines when the two lines are not being
8 operated by the same entity.

9 **Q. Why is paralleling undesirable from a construction and operations**
10 **standpoint?**

11 A. Apart from the potential for increased cost, it is undesirable to construct
12 parallel transmission lines because, unless there is sufficient separation between the lines,
13 during construction of the second line, the first must be taken out of service. Paralleling is
14 undesirable from an operations perspective for the similar reason that, while maintenance is
15 being performed on one line, the other may need to be taken out of service so that large
16 equipment can access the area. Having two lines down at any given point risks the reliability
17 of the transmission system at large. Moreover, from a reliability perspective, common or
18 adjoining rights-of-way are susceptible to common-mode failures. In other words, it
19 increases the probability that, if one line fails, it will cause the adjacent line to fail. Likewise,
20 weather events, either directly or from debris, can cause both lines to fail. For these reasons,
21 paralleling existing transmission lines generally is not preferred.

22 **Q. Testimony filed by ATXI in this case suggests that the failure of the steel**
23 **monopoles that are to be used on the Project is very unlikely. Doesn't that eliminate or**

1 **significantly reduce the risk of paralleling other transmission lines?**

2 A. It is sometimes said that a chain is only as strong as its weakest link. While
3 the ATXI lines are of modern design and very reliable, they are not immune from all damage.
4 Another circuit of older design, or made of materials that are not as strong, or not engineered
5 for the same external loads may still be hazard to the new transmission line that is the subject
6 of this case. And there are no shields that would protect from wind-blown debris that could
7 affect both new and old circuits.

8 **Q. You stated common or adjoining rights-of-way are susceptible to**
9 **common-mode failures. What is a "common-mode failure"?**

10 A. A common-mode failure is a failure which is a result of one or more events,
11 which cause coincident failures in two or more systems (in this case, transmission lines)
12 leading to failures in the multiple systems (lines). The event(s) responsible for the common-
13 mode failure can be either internal or external to the systems (lines) that are affected. Using
14 practical examples, if a structure of circuit #1 collapses due to a defect or an external event,
15 and it falls on the wires or structures of circuit #2, that is a common-mode failure. Likewise,
16 if a wind event blows limbs, or other debris, into the adjoining wires of both circuits #1 and
17 #2, that is a common-mode failure.

18 **Q. Has Ameren Services constructed parallel transmission lines in Missouri**
19 **in the past?**

20 A. Yes. And, in fact, in limited instances, ATXI has proposed parallel
21 transmission lines as part of this Project, and AMS has proposed parallel lines in some
22 instances in Missouri. The fact that paralleling has been used on a limited basis on the
23 Project, or that Ameren Services has proposed paralleling in appropriate circumstances, does

Surrebuttal Testimony of
Jeffrey V. Hackman, P.E.

1 not mean that every paralleling opportunity should be used. Whether to place the 345 kV
2 transmission line in parallel with an existing transmission line should be based on reliability,
3 cost of construction, cost of reinforcements required, impact on the environment and its
4 improvement to system performance. Here, ATXI proposed routes that best serve the needs
5 of the overall transmission system.

6 **Q. Does this conclude your rebuttal testimony?**

7 **A. Yes, it does.**

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

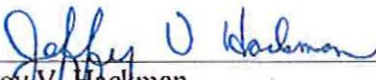
In the Matter of the Application of Ameren Transmission)
Company of Illinois for Other Relief or, in the Alternative,)
a Certificate of Public Convenience and Necessity)
Authorizing it to Construct, Install, Own, Operate,) File No. EA-2015-0146
Maintain and Otherwise Control and Manage a)
345,000-volt 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 St. Louis, Missouri, and I am employed by Ameren Services Company.
2. Attached hereto and made a part hereof for all purposes is my Surrebuttal Testimony on behalf of Ameren Transmission Company of Illinois consisting of 7 pages, ~~XXXXXXXXXX~~ 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

Subscribed and sworn to before me this 16th day of November, 2015.



Notary Public

My commission expires:
2-21-18

