

Exhibit No.:
Issue: American Electric Power Company, Inc.'s
Expertise
Witness: Scott P. Moore
Type of Exhibit: Direct Testimony
Sponsoring Party: Transource Missouri, LLC
Case No.: EA-2012-
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Service Commission

MISSOURI PUBLIC SERVICE COMMISSION

CASE NO.: EA-2012-

DIRECT TESTIMONY

OF

SCOTT P. MOORE

ON BEHALF OF

TRANSOURCE MISSOURI, LLC

August 2012

Exhibit NO. 12
File NO. EA-2013-0098

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

2 A: My name is Scott P. Moore. My business address is 700 Morrison Road, Gahanna, Ohio,
3 43230.

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

5 A: I am employed by American Electric Power Service Corporation (“AEPSC”), a wholly-
6 owned subsidiary of American Electric Power Company, Inc. (“AEP”). I am the Vice
7 President of Transmission Engineering and Project Services for AEP.

8 **Q: On whose behalf are you testifying?**

9 A: I am testifying on behalf of AEP, Transource Energy, LLC (“Transource”), and
10 Transource Missouri, LLC (“Transource Missouri”).

11 **Q: What are your current responsibilities?**

12 A: My current responsibilities encompass all areas of transmission engineering,
13 construction, and maintenance for AEP. I am responsible for development of
14 transmission engineering standards, engineering and design of new or refurbished
15 transmission line and substation facilities, project and construction management, capital
16 cost management, rights-of-way and property acquisition, and transmission system
17 maintenance program management.

18 **Q: Please describe your education, experience, and employment history.**

19 A: I earned a Bachelor of Science degree in electrical engineering from Texas Tech
20 University in 1982 in Lubbock, Texas. I am a registered Professional Engineer in the
21 State of Texas.

22 In January 1983, I joined West Texas Utilities (“WTU”, now part of AEP Texas)
23 as an Electrical Engineer in the System Construction and Maintenance Department. I

1 worked five and one-half years as WTU's Substation Maintenance Engineer. I was then
2 promoted to Telecommunications Engineer in 1988, and to Director, System Operations,
3 in August 1989. I became Director, System Operations for Central & South West
4 Services Company ("CSWS") in March 1994. CSWS was the service company for, in
5 addition to other companies, Public Service Company of Oklahoma ("PSO") and
6 Southwestern Electric Power Company ("SWEPCO"). In July 2000, I was promoted to
7 Vice President Transmission Operations for AEPSC. I became Vice President
8 Transmission System and Region Operations in May 2007. I was then named to my
9 current position in 2010.

10 **Q: Please describe your participation in industry organizations.**

11 A: I serve on the Board of Trustees of the North American Transmission Forum ("NATF").
12 I am also the Chairman of the Human Resources Governance Committee of the NATF. I
13 also serve on the following committees: Electric Power Apparatus Committee ("EPAC")
14 of the Association of Edison Illuminating Companies ("AEIC"); Industry Leadership
15 Council ("ILC") of the Consortium for Electric Reliability Technology Solutions
16 ("CERTS"); Reliability Executive Advisory Council ("REAC") of the Edison Electric
17 Institute ("EEI"); Member Representative Committee of the Texas Reliability Entity
18 ("TRE"); Advisory Committee of the Future Power Grid Initiative ("FPGI") of the
19 Pacific Northwest National Laboratory; and the Industry Advisory Board of Texas Tech
20 University. I was previously a member of the North American Electric Reliability
21 Corporation ("NERC") Member Representative Committee.

1 **Q: Have you previously testified in a proceeding before the Missouri Public Service**
2 **Commission (“Commission” or “MPSC”)?**

3 A: No. However, I have filed testimony in proceedings before the Federal Energy
4 Regulatory Commission, the Public Utility Commission of Texas, the Oklahoma
5 Corporation Commission, and the Federal Surface Transportation Committee.

6 **Q: What is the purpose of your testimony?**

7 A: The purpose of my testimony is to demonstrate AEP’s technical, procurement, and
8 project management expertise that will contribute to the long-term success of Transource
9 and Transource Missouri.

10 **Q: Please describe AEP’s electric transmission system.**

11 A: AEP owns the nation’s largest electricity transmission system, a nearly 39,000-mile
12 network that includes more 765kV extra-high voltage transmission lines than all other
13 U.S. transmission systems combined. AEP’s transmission system directly or indirectly
14 serves about 10% of the electricity demand in the Eastern Interconnection, and
15 approximately 11% of the electricity demand in the Electric Reliability Council of Texas
16 (“ERCOT”).

17 AEP currently owns and operates over 2,100 miles of 765kV transmission lines,
18 over 5,900 miles of 345kV transmission lines, over 16,000 miles of 138kV transmission
19 lines, and over 11,500 miles of 69kV transmission lines. AEP owns and operates
20 transmission assets in ERCOT, the PJM Interconnection, L.L.C. (“PJM”), and the
21 Southwest Power Pool, Inc. (“SPP”). AEP is also actively developing projects through
22 joint ventures in the Midwest Independent Transmission System Operator, Inc.
23 (“MISO”), PJM, and SPP.

1 **Q: Please describe AEP's technical abilities.**

2 A: AEP's engineering group is one of the largest in the country and equals or exceeds the
3 capabilities of most outside engineering firms. AEP currently employs almost 450
4 people in its line, station, and protection and control engineering organizations. This in-
5 house expertise allows AEP to deliver consistent high-quality engineering, as well as
6 advance technical innovations that provide value to the transmission system and to
7 customers. AEP has a number of existing and pending patents for technologies
8 developed throughout our history. In addition to formal patents, AEP is also a leader in
9 developing technical standards for the industry. For example, the International
10 Electrotechnical Commission's ("IEC") 61850 protocols for the design of electrical
11 substation automation, which were first accepted in 2001, resulted from significant work
12 by AEP to ensure consistent communications standards are used by multiple vendors of
13 electronic devices throughout the industry.

14 AEP is also seen as an industry leader in many technical areas. For example,
15 AEP is viewed as an industry leader in station security and cyber security. I was a
16 founding member of the NERC Critical Infrastructure Protection ("CIP") committee. I
17 was a co-chair of the NERC/Department of Energy partnership on High-Impact, Low
18 Frequency risks to the North American bulk power system that ultimately resulted in a
19 report to the United States Congress. I also have clearance to classified information from
20 the Department of Homeland Security with respect to risks to the bulk power system.
21 AEP has also partnered with Lockheed Martin to develop an advanced cyber security
22 operations center to enhance the real-time cyber security monitoring and operations
23 throughout AEP's smart grid infrastructure.

1 Furthermore, AEP is viewed as a leader in the application of Flexible Alternating
2 Current Transmission Systems (“FACTS”)¹, which is evident in our ongoing work in the
3 Competitive Renewable Energy Zone (“CREZ”) of ERCOT. AEP’s current work
4 through Electric Transmission Texas (“ETT”), a joint venture between AEP and
5 MidAmerican Energy Holdings Company to build transmission projects within ERCOT,
6 is believed to be the greatest concentration of power electronics² in North America.

7 **Q: Please provide some specific examples that demonstrate AEP’s technical expertise.**

8 A: AEP has been a leader in the development of transmission technology since the earliest
9 days of its history. AEP energized the first long-distance transmission line, connecting a
10 mine-mouth power plant with a major load center in 1917. Since that time, AEP has
11 continued the pursuit of new and better ways to transmit electricity from generation to
12 load and has been responsible for a number of “firsts” in the electric transmission
13 industry as outlined below:

- 14 • First to perform extra high voltage line testing up to 500kV at the Tidd Project
15 in eastern Ohio in 1947;
- 16 • First to develop an extra high voltage interconnection with a neighboring
17 utility when it energized a 345kV line between AEP and Commonwealth
18 Edison in 1958;
- 19 • First to utilize a 765kV line when it energized a line between the Baker
20 Station in Kentucky and the Marquis Station in Ohio in 1969;

¹ FACTS is a power electronic based system and other static equipment that provide control of one more AC transmission system parameters to enhance controllability and increase power transfer capability.

² Power electronics is the application of solid-state electronics for the control and conversion of electric power.

- 1 • First application of a Static Var System (“SVS”) to maintain voltage on the
- 2 transmission grid at the Beaver Creek Station in Kentucky in 1980;
- 3 • First to utilize a Unified Power Flow Controller (“UPFC”) on the transmission
- 4 system at the Inez Station in Kentucky in 1998;
- 5 • First dead-tank sulfur hexafluoride circuit breaker at 765kV at the Orange
- 6 Station in Ohio in 2001;
- 7 • First variable frequency transformer in the United States in 2007; and
- 8 • First application of broadband over power line carrier at 69kV (2007) and
- 9 138kV (2010).

10 These examples are a small sample of the ground-breaking research and innovation that
11 AEP has employed over the past 65 years and are a testament to the knowledge,
12 experience, and abilities of AEP’s transmission engineering organization.

13 **Q: Please describe AEP’s procurement abilities and the benefits of those abilities to**
14 **Transource.**

15 **A:** Transource will benefit from the size and scope of AEP’s transmission business. As one
16 of the largest electric utilities in the country, AEP is able to translate that size into
17 purchasing power with both material suppliers and labor contractors. With
18 approximately \$3.7B invested in operating company transmission assets over the past ten
19 years, AEP has developed strong relationships with multiple suppliers, which enables it
20 to negotiate favorable terms for pricing, delivery, and other contract provisions. AEP’s
21 purchasing volumes across all of its operating companies and joint ventures realize the
22 benefits of economies of scale. In fact, AEP has blanket contracts with most material
23 suppliers that contain “most favored nation” clauses. As a consequence, AEP’s presence

1 in the marketplace allows it to realize the lowest total evaluated cost for materials. For
2 example, in 2011, ETT executed three steel pole contracts worth over \$200M. One of
3 these contracts will require approximately 5,800 flatbed trucks and will take
4 approximately 15 months to deliver. The size of the order and the prospects for
5 continuing business are an aid to AEP when negotiating to meet such requirements.

6 Transource will also benefit from the spare equipment inventory of the entire AEP
7 transmission system. This minimizes the spare equipment that Transource must maintain
8 as a stand-alone entity, potentially provides access to a wider range of equipment, and
9 significantly reduces the delivery time compared to making a replacement equipment
10 purchase from a supplier. For example, a spare transformer from AEP's Indiana
11 operating company was recently shipped to AEP's Oklahoma operating company after a
12 transformer in Oklahoma experienced problems. The ability to utilize a spare
13 transformer from the system spare equipment inventory reduced the time the equipment
14 was not available for service because purchasing a new replacement transformer would
15 have necessitated a longer lead time.

16 AEP's system material inventory is also a significant benefit when performing
17 major storm restoration. AEP's diverse operating areas typically limit system-wide
18 exposure to major storms, so when a storm impacts one region, materials and supplies
19 can be accessed from other regions, which can improve the speed in which restoration
20 occurs. For example, AEP's eastern operating company experienced a derecho³ storm on
21 June 29, 2012 that impacted over 260 transmission circuits, over 420 transmission
22 stations, and more than 500 transmission poles, causing almost 1.5 million customer

³ A derecho is a widespread, long-lived, straight-line windstorm that is associated with a fast-moving band of severe thunderstorms. Straight-line winds produced by these storms can exceed 100 miles per hour.

1 outages. Due to AEP's ongoing transmission construction and maintenance activities,
2 construction materials already in inventory were used during the restoration. Without the
3 availability of the existing inventory, outside material suppliers would have been
4 challenged to supply the needed materials as quickly. The existing inventory, combined
5 with AEP's outstanding relationships with material suppliers, prevented material issues
6 from hindering the restoration of this unprecedented storm.

7 AEP also has long-standing relationships with large engineering and construction
8 firms that provide labor resources in the transmission sector. AEP works almost
9 continuously with Black & Veatch, Burns & McDonnell, Commonwealth Associates,
10 Kiewit, MYR Transmission Services, Pike Electric, Quanta Services, and Power
11 Engineers on various projects throughout its system. By utilizing long-standing
12 relationships with these firms, standards and expectations are already established, and
13 time and expense are not spent going through the learning curve with each new project.
14 This will bring significant value to Transource as it will be able to utilize this experience
15 on its regional transmission projects.

16 **Q: Will AEP participate in procurement for the Iatan-Nashua Project and the Sibley-**
17 **Nebraska City Project through Transource Missouri?**

18 A: Yes. AEP is presently working with the KCP&L project team to identify opportunities to
19 benefit the procurement of services and materials for the Iatan-Nashua 345kV Project and
20 the Sibley-Nebraska City 345kV Project. In addition, Transource Missouri will leverage
21 the economies of scale generated by AEP's procurement operations in future
22 procurement activities.

1 **Q: Please describe AEP’s transmission project management abilities.**

2 A: AEP currently employs over 100 people in its transmission project management and
3 construction management organizations. AEP annually manages over \$1B in projects
4 with more than 100 large projects (greater than \$1M) active at any one time. To manage
5 this volume of projects, AEP employs a Project Lifecycle Management Process⁴, which
6 provides structure to the lifecycle of projects. By utilizing a standardized process with
7 established procedures, terms, definitions, and work aids, large projects can be managed
8 efficiently and effectively. This is particularly important when multiple projects are
9 active at any single time.

10 **Q: Please provide some specific examples that demonstrate AEP’s project management**
11 **abilities.**

12 A: AEP is currently active in ETT’s \$1.4B development of Texas CREZ projects. ETT is
13 building approximately 465 miles of double-circuit 345kV lines and 16 substations and is
14 acquiring rights-of-way across 578 tracts of land. One component of these projects is the
15 use of a drop-in control module at the Tesla Transmission Station, which utilizes a unique
16 prefabricated unit that substantially reduces substation construction costs. The use of
17 drop-in control modules is being pioneered by AEP to take advantage of the standard
18 design specifications used throughout AEP’s system. Another specific example is AEP’s
19 planned work to reconductor approximately 216 energized miles of 345kV transmission
20 lines in south Texas. The experience gained from planning and executing this
21 complicated project in Texas will pay dividends for the similar energized line work

⁴ The Project Lifecycle Management Process (“PLMP”) is the process AEP uses to manage projects from the portfolio development stage to the close out stage. It entails the critical aspects of the project management discipline and provides structure to the management and monitoring of multiple projects simultaneously.

1 expected to be performed on a portion of the Iatan-Nashua 345kV Project as described in
2 the Direct Testimony of Brent C. Davis.

3 AEP is also actively working on a new \$136M transmission station near Sunbury,
4 Ohio. The 765/345/138kV Vassell Station is a major transmission reinforcement effort to
5 help AEP maintain an adequate level of transmission reliability in central Ohio. This
6 entire project, from engineering to procurement to construction management, is being
7 managed internally.

8 As stated above, these are only selected examples of the many projects that AEP
9 is managing at any one time. The large number of active projects provides AEP
10 employees with the opportunity to stay current on the newest ideas and concepts in the
11 project management field, while also maintaining a high level of performance.

12 **Q: How will AEP support Transource Missouri from a technical, procurement, and**
13 **project management perspective?**

14 **A:** AEP will support Transource Missouri from a technical, procurement, and project
15 management perspective by collaborating with its peers within KCP&L's project team.
16 Per the April 3, 2012 Services Agreement between Transource and AEP, AEP provides
17 services such as Engineering and Design Services, Procurement Services, and
18 Construction Services to Transource. The August 28, 2012 Support Agreement between
19 Transource and Transource Missouri enables Transource Missouri to access these same
20 services from AEP through Transource. This will enable Transource Missouri to
21 leverage the technical and procurement strengths of AEP, as demonstrated above, in
22 completing projects for which Transource Missouri is responsible. Details on the

1 Services and Support Agreements referenced above are contained in the Direct
2 Testimony of Darrin R. Ives in Case No. EO-2012-0367.

3 **Q: Does this conclude your testimony?**

4 A: Yes, it does.

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

In the Matter of the Application of)
Transource Missouri, LLC for a Certificate)
of Convenience and Necessity Authorizing it) Case No. _____
to Construct, Finance, Own, and Operate the)
Iatan-Nashua and Sibley-Nebraska City)
Electric Transmission Projects.)

AFFIDAVIT OF SCOTT P. MOORE

STATE OF OHIO)
) ss
COUNTY OF FRANKLIN)

Scott P. Moore, being first duly sworn on his oath, states:

1. My name is Scott P. Moore. I work in Columbus, Ohio, and I am employed by American Electric Power Service Company ("AEPSC"), a wholly-owned subsidiary of American Electric Power, Inc ("AEP"). I am the Vice President of Transmission Engineering and Project Services for AEP.

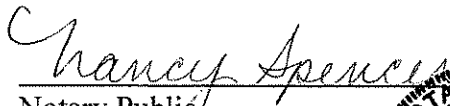
2. Attached hereto and made a part hereof for all purposes is my Direct Testimony on behalf of Transource and Transource Missouri, LLC ("Transource Missouri") consisting of (11) pages, having been prepared in written form for introduction into evidence in the above-captioned docket.

3. I have knowledge of the matters set forth therein. I hereby swear and affirm that my answers contained in the attached testimony to the questions therein propounded, including any attachments thereto, are true and accurate to the best of my knowledge, information and belief.



Scott P. Moore

Subscribed and sworn before me this 31st day of August, 2012.



Notary Public

My commission expires: May 10, 2016



Nancy Spencer
Notary Public, State of Ohio
My Commission Expires 05-10-2016