PJM RTEP – 2014/15 RTEP Long Term Proposal Window: Meadowbrook to Doubs 230 kV Proposal

A Proposal to PJM Interconnection, Submitted February 27, 2015

Submitted by

Transource Energy, LLC

1 Riverside Plaza, Columbus, Ohio 43215-2372

Table of Contents

A. Executive Summary

Introduction

Transource Energy, LLC (Transource) submits this proposal (the Proposal) to PJM Interconnection, LLC (PJM) in response to the *PJM RTEP 2014/15 RTEP Long Term Proposal Window.* This Proposal details a proposed solution to solve system congestion issues on the AP South and AEP-Dominion interfaces. Transource seeks to be considered the Designated Entity for the project described within this Proposal, subject to determination regarding components deemed upgrades by PJM.

Transource was specifically formed as a joint venture between subsidiaries of American Electric Power Company (AEP) and Great Plains Energy Incorporated (GPE) to participate in competitive processes for transmission development and to provide benefits to transmission customers through the planning, construction and ownership of high quality, low cost transmission infrastructure.

Transource has collaborated with Burns and McDonnell (BMcD), a nationally recognized leader in infrastructure design and project management, and PAR Electrical Services, Inc. (PAR), in the development of this Proposal. BMcD and PAR have worked with Transource to develop the cost, schedule, and constructability analysis. PJM can have confidence knowing that this key information was developed in conjunction with BMcD and PAR, firms that bring a wealth of knowledge and experience designing, constructing, and executing transmission projects across the United States.

Transource Energy

Transource was formed to pursue the development of competitive transmission projects in marketplaces initiated by the implementation of FERC Order No. 1000. AEP owns 86.5 percent of Transource, and GPE owns 13.5 percent. The combined strengths of AEP and GPE in engineering, project management, procurement, project development, construction, operation and maintenance will bring to bear effective and efficient delivery of transmission solutions that benefit transmission customers.

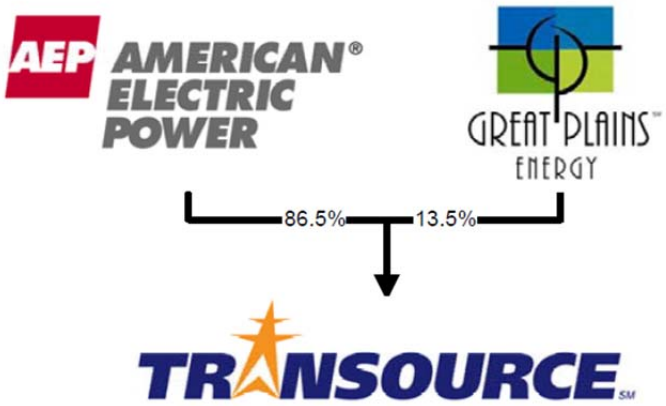

Figure 1 - Summary of Transource Ownership Structure

Transource is currently developing two Southwest Power Pool (SPP) approved transmission projects in the state of Missouri through its subsidiary Transource Missouri LLC (Transource Missouri). The Iatan-Nashua 345 kV transmission project is currently under construction, and the Sibley-Nebraska City 345 kV transmission project is currently in the engineering, design and rights-of-way (ROW) acquisition phase. Transource received approval from the Federal Energy Regulatory Commission (FERC) of a formula rate and certain incentives for Transource Missouri in FERC Docket No. ER12-2554. In addition, Transource Missouri received approval from the Missouri Public Service Commission of a settlement filed in File No. EA-2013-0098 for a line Certificate of Convenience and Necessity to finance, construct, own, operate and maintain these two projects.

Transource has been pre-qualified to be a Designated Entity for transmission projects in PJM under section 1.5.8 (a) of the PJM Operating Agreement. The pre-qualification information is contained in the document submitted to PJM on April 29, 2013, entitled *Pre-Qualification Application of American Electric Power and Certain Affiliates*. This document is on record with PJM and posted on the PJM website, with PJM pre-qualification ID of 13-05. PJM confirmed the pre-qualified status of Transource in a letter dated July 7, 2013. As required annually, Transource has reviewed this information and determined that no updates are required.

The figure below provides a snapshot of the states in which Transource's owners, AEP and GPE, currently own or are developing transmission assets.

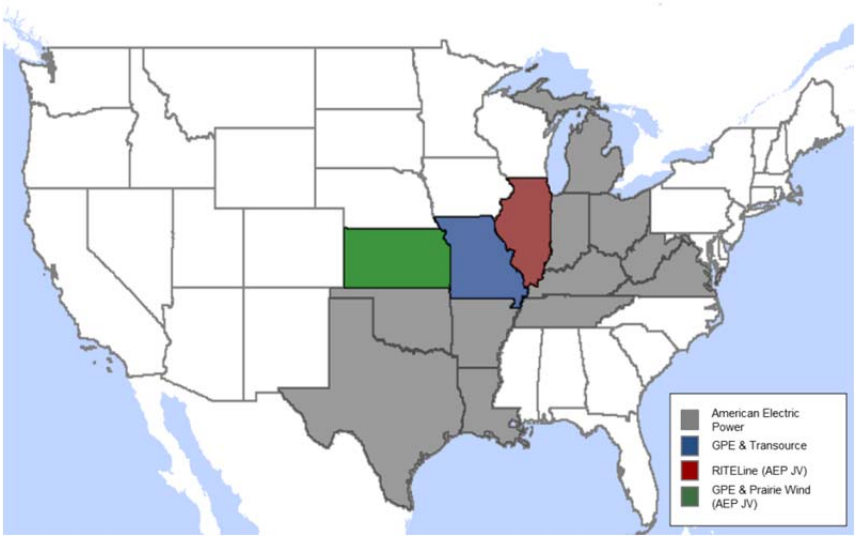

Figure 2 - Combined Transmission Presence

The Proposed Project

Transource proposes to build the Meadowbrook to Doubs 230 kV (or the "Project"). PJM should evaluate the Project as one proposal including all of the facilities. The Project includes the following facilities:

- Approximately 50 miles of new double-circuit 230 kV alternating current overhead transmission line between the existing Meadowbrook and Doubs substations.
- The Doubs substation will be expanded to accommodate the new 230 kV line. Any work required at Doubs is assumed to be designated to the incumbent transmission owner as an upgrade.
- The Meadowbrook Substation will be expanded to accommodate the new 230 kV line. The expansion required at Meadowbrook is assumed to be designated to the incumbent transmission owner as an upgrade.
- Dooms Substation: Add a new 175 MVAR 230 kV capacitor bank and associated switchgear.
- Lexington Substation: Add a new 175 MVAR 230 kV capacitor bank and associated switchgear.
- Brambleton Substation: Add two new 175 MVAR 230 kV capacitor bank and associated switchgear.
- Ashburn Substation: Add two new 175 MVAR 230 kV capacitor bank and associated switchgear.
- AEP's Jackson's Ferry substation: Add a new 250 MVAR 138 kV capacitor bank and associated switchgear.
- AEP's Broadford substation: Add a new 250 MVAR 138 kV capacitor bank and associated switchgear.

Preliminary analysis by the Transource suggests that adding the specified capacitor banks at the substations selected will be feasible; however, certain locations may present issues with space availability given ongoing or planned construction. The Transource has identified several alternate locations for capacitor banks that will deliver similar system benefits that can be used if any of the selected locations prove not constructible.

Transource believes that the combination of shunt capacitors and new transmission line and station facilities included in the Project provides a robust, cost effective and feasible solution to address congestion under varying system conditions. In contrast, the Transource evaluated various combinations of the shunt capacitor banks as standalone options (shunt-only options). Many shunt-only options do exceed the B/C threshold; however, the Transource believes such upgrades would serve only as a short term fix to shift congestion to other areas rather than resolve the system issues. For example, a shunt-only option may reduce congestion across the AP South interface while increasing congestion across the AEP-Dom interface.

Furthermore, the Transource believes the benefits of shunt-only options are mostly "on paper" (i.e. driven by the analysis approach) rather than benefits that will be delivered in real-time operations like those from a robust solution. To expand on this point, PJM's proxy methodology to simulate transfers across the interfaces by scaling the load up in the sink areas results in reactive deficiency which the shunt capacitors appear to stabilize. However, these analytical benefits are likely to be limited in a real-time simulation when opportunity transfers are taking place across the PJM system and sink areas are more expansive.

For the purpose of this proposal, the Transource developed the Conceptual Route based on a desktop review of publicly available data. In addition, experienced line and station construction representatives from PAR Electric (PAR) conducted field visits to confirm the feasibility of the Conceptual Route. The Conceptual Route was used as the basis for the designs and estimates contained in this proposal. However, the Conceptual Route is not intended to represent a preferred, alternate or final conceptual route for purposes of the applicable siting, permitting and other regulatory approval processes.

A Project Study Corridor Map is provided below. Please note that this Proposal contains multiple graphics that are available in high-resolution format upon request. The Project Study Corridor Map provides a snapshot of the constraints that could be encountered during the applicable state routing process.

[REDACTED]

Figure 3 - Project Study Area

Transource has collaborated with BMcD and PAR to complete the necessary project development work to determine project constructability, cost estimates, and a schedule. The estimated capital cost of the Project is approximately $237 million. This estimated cost includes all components of the Project, including components that PJM may consider as upgrades. The expected schedule duration is 64 months from the project award date, which is assumed to be January 2016, resulting in an expected in-service date of April 30, 2021.

Attachment 1 of this Proposal includes the required analytical files as set forth in *PJM RTEP – 2014/15 RTEP Long Term Proposal Window Problem Statement & Requirements Document.* Attachment 2 of this Proposal includes the required 2014/15 RTEP Long Term Proposal Window Template.

Details Regarding Construction Cost Cap Provisions

Transource offers a cost containment mechanism for the Project that provides substantial financial incentive for Transource to deliver its designated components of the Project at or below its estimated project cost. Under the cost containment mechanism for this Project:

(a) Transource would be entitled to recover its FERC approved return on equity plus incentives on the costs it incurs for the Project up to its estimated project cost of $180.0 million (excludes escalation of project cost of 3 percent per year until the project is placed in service), for the components of the Project designated to Transource;

(b) Transource would forego any return on equity incentives approved by FERC (including the RTO participation adder) for the project cost portion that exceeds the estimated Transource-designated project cost of $180.0 million. For purposes of this incentive rate waiver, Transource will escalate the estimated project cost at 3 percent per year until the project is placed in service.

(c) In addition, in order to provide certainty to the customer rates, Transource commits to an actual equity content of no greater than 50 percent for the Project, once permanent financing is in place. This assumes that the capital market conditions remain normal and

provides for the ability to finance these transmission projects with the proposed capital structure.

Summary of System Impact

Discussion of analytical details and results

The Transource has studied the calculations of AEP-DOM and AP South reactive interface limits and determined that these interfaces are interrelated. As such, project solutions focused only on fixing the AP South interface will in turn increase congestion on AEP-DOM interface and vice versa. The Transource has focused its efforts on proposals that not only meet or exceed the 1.25 Benefit / Cost (B/C) threshold, but also offer considerable reductions in regional congestion.

Determining the benefits offered by the Project requires a 2-step process. The first step involves running a PV analysis to determine the increase or decrease in the ratings of AP South, AEP-DOM and other relevant reactive interfaces. The second step involves computing the regional or local benefits, based on the voltage of the proposal, using the change in ratings of the interface.

Interface Ratings

The Transource understands that the limit is computed using the latest RTEP peak model with Security Constrained Economic Dispatch (SCED). The incremental improvement in the AP South and AEP-DOM interface ratings should remain proportional as long as the source, sink, monitored elements and contingencies are consistent with PJM's document on "Determination of Real-Time Inter/Intra Regional Transfer Capability PJM EMS Transfer Limit Calculator".

For the AP South and AEP-DOM interfaces, the voltage deviation and the voltage magnitude limits are based on the TO's Planning Criteria. The Transource has performed a generation to load transfer analysis, where generators in the source areas are scaled up and the load in the sink areas are scaled up. All Phase Angle Regulators (PAR) are locked, the source generators are scaled up to 110% of their limits,

and sink loads are scaled up without limits. Capacitor banks and Load Tap Changers (LTCs) are allowed to adjust pre-contingency. Also, Capacitor banks are allowed to adjust post-contingency.

The rating improvements are listed below:

Interface	Rating Change (MW)
AP South	385
AP South for loss of Black Oak – Bedington	375
AEP-DOM for loss of Black Oak – Bedington	50
Central	35
Western	105
5004/5005 for loss of Kenny – Rocksprings	-15
Black Oak – Bedington	0
Black Oak – Bedington for loss of T157 - Doubs	-25

Economic Benefits

The second step in the process involves computing the economic benefits of the Project. The Net Present Value (NPV) of the Project cost and benefits along with the calculated B/C are listed below. These values are based on the in-service date stated above.

15-Year Net Present Value of Aggregated Cost (in millions)	15-Year Net Present Value of Benefits using the Local Metric (in millions)	Benefit / Cost utilizing the Local Market Efficiency Metric
$344.7	$515.2	1.49

The table below shows sizeable reduction in congestion on various interfaces and facilities identified by PJM:

Flowgate	Congestion Reduction in 2022 (in millions)	Congestion Reduction in 2025 (in millions)
AP South FLO Black Oak – Bedington 500 kV	$43	$66
AEP-DOM FLO Black Oak – Bedington 500 kV	$2	$2
Carroll – Taneytown 138 kV (2 contingencies)	$9	$9
Black Oak – Bedington 500 kV FLO T157 – Doubs 500 kV	$1	$3

The Value Proposition

Selecting Transource as the Designated Entity for the proposed Meadowbrook to Doubs 230 kV Project will provide significant value to electric customers in the PJM region based on the following factors:

- **The Project delivers significant customer savings in excess of the cost**. The Project provides $515.2 million in local cost saving benefits to PJM customers with a projected benefit to cost ratio of 1.49.
- **The Project is a robust solution that greatly reduces congestion on the PJM system.** The Project increases the rating of the AP SOUTH interface by 385 MW, the AP SOUTH contingency interface by 375 MW, and significantly reduces congestion on the AEP-DOM interface.
- **Transource has assembled a highly qualified project development team.** Transource has engaged a team of industry-leading engineering and construction firms in Burns & McDonnell and PAR to complement AEP's experienced extra high-voltage engineering team to complete the Project. This collaborative team has unmatched experience successfully designing, constructing, operating and maintaining EHV facilities.
- **Extensive Virginia and West Virginia-specific siting and regulatory experience.** AEP owns and operates over 6,000 miles of transmission lines in the states of Virginia and West Virginia, combined, providing unmatched experience navigating these states' unique siting and regulatory processes.

As shown in Section C.d., the Meadowbrook to Doubs 500 kV Project has significant environmental, permitting, and siting challenges, and ultimately may not be permittable.

Summary of Project Development & Ownership Plan

Transource will execute the Project using AEP's proven resources and standardized practices to develop, own, operate and maintain transmission assets. AEP has successfully executed similar projects within its territory, including those within Virginia and West Virginia.

A unique aspect of the development plan is securing federal and state regulatory approvals for Transource, a new transmission-only entity in West Virginia, Virginia and Maryland, to finance, construct, own, operate and maintain the new transmission facilities. Transource will draw on AEP's extensive experience and successful track record of securing federal and state regulatory approvals for transmission-only entities in states both within and outside of its traditional utility footprint. AEP has received approvals for new transmission-only utility companies in ten states within the last several years. Of particular significance is AEP's recent success in securing regulatory approvals for the AEP Transcos, particularly AEP West Virginia Transmission Company, Inc. in the state of West Virginia. This approval is similar to those that will be required for Transource, for the initiation of the operations as a public utility. PJM can also be confident in the ability of Transource to secure these approvals because Transource has demonstrated success to date with its utility subsidiary in Missouri.

Transource anticipates executing the remainder of the project development plan in collaboration with a qualified, competitive Engineering, Procurement and Construction (EPC) service provider (EPC Service Provider). This engagement will leverage AEP's engineering, procurement and project management resources. This provides advantages based on AEP's experience and significant scale to achieve a low cost of materials and successfully develop the Project, to the benefit of wholesale transmission customers. In addition, Transource will work with the selected EPC Service Provider, or other qualified service providers, on other critical services necessary to deliver the Project on time and on budget, including permitting, siting, environmental and ROW acquisition.

AEP has been successful in jointly implementing many projects using third-party resources; for example, AEP is currently using a similar EPC approach to implement its complex Competitive Renewable Energy Zones (CREZ) projects in Texas for its Electric Transmission Texas, LLC (ETT)

subsidiary. The ETT portion of CREZ consists of the siting and construction of over 465 miles of 345 kV lines and 16 associated stations with a total project cost of approximately $1.5 billion. In addition, AEP has used a third-party approach to implement numerous line and station projects across its 11-state service territory with complex schedule and coordination requirements. Currently, AEP uses third-party engineering services to engineer about half of its $2 billion dollar capital project portfolio on an annual basis. As part of its business practices, AEP oversees third-party contractors to ensure that projects are implemented safely, on time, and within budget.

Upon placing the Project into service, Transource will own, operate, and maintain the new facilities. Transource plans to operate these facilities from AEP's state-of-the art System Control and Transmission Dispatch Center in New Albany, Ohio. Transource will responsibly field a maintenance staff to support the Project, using either the considerable resources of AEP or carefully selected external resources, or a combination thereof. AEP has a longstanding relationship with many reputable companies that perform operations and maintenance services within PJM. Upon designation of the Project by PJM, Transource will develop contractual agreements with these or other suitable providers to perform maintenance services including first-responder, corrective maintenance, preventive maintenance, and emergency restoration for the transmission line facilities.

B. Company Evaluation Information

Transource Energy

Transource was formed to pursue the development of competitive transmission projects in marketplaces initiated by the implementation of FERC Order No. 1000. AEP owns 86.5 percent of Transource, and GPE owns 13.5 percent. Transource will use all of the applicable resources of AEP and GPE to successfully develop competitive transmission projects. The combined strengths of AEP and GPE in engineering, project management, procurement, project development, construction, operation and maintenance are expected to result in effective and efficient delivery of transmission solutions that benefit transmission customers. For this Project, Transource will use AEP's extensive resources in the PJM region. Therefore, this 'Company Evaluation Information' section focuses on the resources, capabilities and proven track record of AEP.

American Electric Power Company

AEP is one of the largest electric utility holding companies in the United States. AEP is headquartered in Columbus, Ohio. AEP delivers electricity to more than five million customers in 11 states. AEP operating utilities provide service to retail and wholesale customers in Arkansas, Indiana, Kentucky, Louisiana, Michigan, Ohio, Oklahoma, Tennessee, Texas, Virginia, and West Virginia. AEP directly or indirectly serves about 10 percent of the electricity demand in the Eastern Interconnection and approximately 11 percent of the electricity demand in the Electric Reliability Council of Texas region.

AEP owns, operates and maintains the largest transmission system in the United States, across the widest spectrum of voltage classes, with $8.6 billion in transmission assets in 2012. This is forecasted to grow to more than $11 billion by 2015. This 39,000-mile network includes more 765 kV Extra-High Voltage (EHV) transmission lines than all other U.S. transmission systems combined. Currently, AEP has more than 600 Baseline projects, Supplemental projects and Network upgrades in the Regional Transmission Expansion Plan in various stages of planning and construction. AEP has transferred functional control of its transmission facilities to PJM, SPP and ERCOT within their respective

regions. Please see the *2012 AEP Transmission Outlook Summary Report* included in this proposal as Appendix A for additional information about AEP's transmission business.

The entire AEP transmission system is planned and operated on an integrated basis through the coordinated efforts of the AEP Transmission Department (AEP Transmission), a business unit of American Electric Power Service Corporation. AEP Transmission coordinates all development and operational aspects, including engineering, project management, design, development, rights-of-way acquisition, construction, operation and maintenance, of AEP's transmission business on behalf of its utility operating companies and transmission companies.

AEP has pioneered new approaches for the development of large transmission projects, both inside and outside its traditional service territory, and achieved the necessary regulatory approvals to make these new approaches a reality. AEP has successfully partnered with numerous other transmission owners on various joint ventures, including MidAmerican, Westar, Exelon and Duke. In addition, AEP has formed and gained state regulatory approval of new transmission-only companies (Transcos) in several states. These companies complement AEP's vertically integrated utility subsidiaries by owning and operating large, new projects on AEP's transmission system. Transource and its wholesale transmission customers will benefit from AEP's proven expertise in securing regulatory approvals at both the FERC and state levels in the development of competitive transmission projects.

Selection and Oversight of EPC Resources

As discussed above, Transource expects to contract with an EPC Service Provider for elements of the execution plan for the Project and, potentially, another third party for routine maintenance, first-responder and emergency restoration activities. Of particular importance, Transource will select an EPC Provider that has significant experience in underwater-line transmission projects and in executing projects in the geographic area of Eastern PJM. In each case, Transource will employ the contractor selection, oversight practices and resources of AEP Transmission.

AEP anticipates using only contractors on its list of approved contractors. To qualify, all contractors are assessed on their commitment to safety and health via a thorough review of their safety program, past experiences, policies and procedures. To be considered for the approved contractor list, contractors must register with AEP Transmission and provide operational and financial data, three years

of OSHA Records and their Experience Modification Rate (EMR). AEP requires a contractor to sustain an OSHA Recordable Rate of 3.0 or lower and 1.0 or lower on their EMR.

An extensive review of the contractor's safety program, ability to provide necessary equipment and ability to do the work is performed by AEP Transmission safety, engineering, project management and construction professionals. The depth of the review is based on the type of work to be performed, often requiring 8 to 12 hours of comprehensive, face-to-face meetings. The following types of work require this comprehensive, on-site review at the contractor's headquarters:

- Electrical construction and maintenance
- Crane required work
- Excavating
- Working from heights
- Land clearing and tree trimming

AEP Transmission generally approves new vendors on their suitability in the following areas:

- Ability to provide sufficient resources (qualified personnel, knowledge, equipment, special procedures)
- Overall cost-effectiveness
- Existing relationships with other vendor and suppliers
- Conformance to AEP Transmission safety culture

All approved vendors must be qualified according to the above criteria and demonstrate conformance to the AEP Transmission safety culture.

In addition, Transource will draw on AEP Transmission's extensive knowledge and experience in Extra High Voltage transmission projects in the oversight and management of the EPC Service Provider. Specifically:

- Transource will assign an internal AEP project manager to oversee the overall project execution. This project manager will serve as the liaison between the EPC Service Provider and AEP internal engineering, procurement, siting & environmental, construction management, and safety resources which will support the Project. The assigned project

manager will be responsible for managing overall project costs, schedules and adherence to internal AEP process and practices.

- AEP Transmission Engineering will coordinate with the EPC Service Provider and conduct a review of engineering deliverables related to the three engineering disciplines indicated above. This will include initial and prearranged review of engineering and design drawing packages throughout the engineering life cycle, review of equipment and material specifications and participation in witness and acceptance testing. In addition, AEP Transmission Engineering personnel will lend assistance to the EPC Service Provider as required for construction support. AEP Transmission will maintain an assigned engineering team to provide the services stated above and any engineering support as required through project completion.

Technical and Engineering Qualifications

Transource will use internal AEP resources to provide engineering and technical support relevant to the construction, operation and maintenance of the proposed project. AEP currently employs nearly 450 professionals in its line, station, and protection and control engineering organizations. In-house engineering expertise allows AEP to consistently deliver high-quality results and advanced technical innovations that both improve the transmission system and add value for customers. These skills have been developed over a 100+ year history of siting, designing, constructing and operating over 39,000 miles of transmission lines and over 4,000 substations.

In addition, AEP has pioneered EHV power transmission; designing and building the strongest most extensive EHV network in the world with more miles of 765,000-volt transmission lines in service than all other U.S. electric utilities combined –2,110 miles.

The following list represents the major activities performed and supported by AEP:

- Federal, State, local and County Environmental and Non-environmental Project Permitting and Licensing
- Routing, Siting and Right-of-Way Leases and Acquisition
- Transmission Substation and Line Detailed Engineering and Design including Drawings for Plan and Profile, Location Plan, One Line, Foundations, Structures, Elementary and

Wiring, Electrical Assembly, Cable and Grounding, Protection and Control, Panel and Cabinets, Metering and Instrumentation and Phasing Diagrams.

- Material and Equipment Specification and Procurement
- Construction Labor Packages that include Construction and Equipment Drawings, Technical Specifications, Bill of Materials, Relay Instrumentation and Metering Notes and Operating Procedures
- Technical Support during Construction
- Equipment Checkout, System Commissioning and Energization Procedures and Support
- Development of Operations, Monitoring and Control Procedures

Experience Developing, Constructing, Operating and Maintaining Similar Facilities

AEP, as the parent company of Transource with extensive operators in PJM, will be responsible for the development, construction, operations and maintenance of the Project. AEP is the largest transmission owner in the United States and one of the largest in West Virginia and Virginia. As shown in the table below, AEP solely or jointly owns over 39,000 miles of transmission line.

Miles of Transmission Line Owned	Solely Owned (AEP)	Jointly Owned (AEP)
In the United States of America:	35499	4751
Globally (U.S. and international):	35499	4751
AC Lines (<100 kV[1]):	24016	341
AC Lines (100 kV < 200 kV[1]):	16162	480
AC Lines (230 kV[1]):	45	195
AC Lines (345 kV[1]):	4356	3453
AC Lines (500 kV[1]):	0	190
AC Lines (765 kV[1]):	2047	91
HVDC Lines:	0	0

[1] kV level of transmission lines represents design voltage.

In addition, as shown in the table below, AEP solely or jointly owns over 4,000 substations.

Number of Substations Owned	Solely Owned (AEP)	Jointly Owned (AEP)
In the United States of America:	4117	98
Globally (U.S. and international):	4117	98
VAC (<100 kV[2]):	2389	23
AC (100 kV < 200 kV[2]):	1541	42
AC (230 kV[2]):	5	1
AC (345 kV[2]):	140	31
AC (500 kV[2]):	4	0
AC (765 kV[2]):	38	1
HVDC Converters:	3	0

As shown in the table below, AEP has over 2,300 employees that engage in various aspects of transmission development, construction, operations and maintenance. These employees bring over 18,700 total man-years experience in project implementation and over 14,700 total man-years in operations and maintenance.

In-House Staff & Support Resources (AEP)	Solely Owned
Total number of existing in-house personnel engaged in transmission project implementation and/or transmission facility operations & maintenance[3]:	2,304
Total man-years of experience in project implementation:	18,705
Total man-years of experience in operations and maintenance:	14,703

The information above demonstrates AEP's extensive overall experience in developing, constructing, operating and maintaining transmission facilities, including those similar to the Project. The following sections highlight AEP's capabilities and resources in several key areas that are not described in other sections of this Proposal.

[2] kV level of substations represents the high-side terminal design voltage.

[3] In-house staff includes full-time staff, part-time staff, and permanent contractors.

Equipment and Material Procurement

As one of the largest electric utilities in the country, AEP is able to leverage its size with both material suppliers and labor contractors. AEP presence in the marketplace allows realization of the lowest total evaluated cost for materials. AEP has developed strong relationships with multiple suppliers and leverages an approximately $1.8 billion annual capital spend in transmission, which enables AEP to negotiate industry-leading terms for pricing, delivery and other contract provisions.

AEP's purchasing power gives it the unique ability to reserve shop space in advance of actual purchase to meet project needs. AEP has relationships and contracts with multiple major vendors that meet its exacting engineering and manufacturing standards. Strategic master agreements with many of the largest global and domestic equipment manufacturers are used as necessary and offer AEP a decided advantage, particularly when respond to emergencies such as storm damage or equipment failures.

Established relationships with equipment and material suppliers facilitate the development of quality project cost estimates. AEP has established equipment and material blankets, with competitive pricing for such items as circuit breakers, transformers, reactors and steel for station and line structures. AEP's relationships with construction contractors provide certainty when estimating project costs.

Construction

The AEP Transmission construction management group includes 200 experienced construction professionals, making it among the largest and most experienced in the country, equaling or exceeding the capabilities of most industry firms. This group is further enhanced by an extensive field construction organization consisting of almost 700 professionals from AEP's Transmission Field Operations organization. These individuals are based throughout AEP's 11-state service territory. AEP typically constructs more than 100 large projects (more than $1 million) with a combined value of over $1 billion annually. This amount is expected to increase in the coming years.

AEP construction crews are equally at home in terrain that varies from flat fields to the Appalachian Mountains to the corrosive environments of Texas coastline. Construction managers and engineers collaborate on projects. Large and difficult projects, like the construction of over 280 miles of 765 kV line in mountainous terrain, have led to many construction innovations, including use of

partially-assembled structures delivered and installed via helicopter, development of specialized foundations for replacement structures in inaccessible areas and new anchor technologies. The versatility and coordination of AEP and contract construction teams enabled crews to simultaneously construct several sections of the CREZ project in Texas in 2013 to complete a very large and complicated project on-time.

In addition to internal construction management employees, AEP relies on an extensive network of approved construction contractors to build large projects. AEP has established relationships with numerous construction contractors who can provide the qualified labor to build station and line projects; many of these firms are regional or national firms that operate in multiple states. All contractors go through a rigorous prequalification process and must adhere to AEP's standards for quality and safety. Specifically, AEP currently uses over 1,200 construction personnel from over 35 construction firms.

The combination of in-house engineering, construction management expertise and experienced, trained internal and contract construction crews with specialized construction equipment allows AEP to deliver consistent, high-quality results together with advanced technical innovations that improve the transmission system and add value for customers.

Control Center Operations

AEP has over 250 employees dedicated to operating its five Transmission Dispatch Centers (TDCs) and System Control Centers (SCCs) on a 24x7x365 basis. The TDCs are staffed with NERC-certified personnel who direct and manage all transmission dispatching and switching functions across the AEP system. They successfully complete 250,000 annual switching steps with an accuracy rate in excess of 99.99 percent. TDCs coordinate with other Transmission Operators as appropriate.

Operators in the SCC use a variety of tools to operate the AEP system including state estimation, real-time contingency, and visualization and situational awareness tools. Contingency analyses are run every 4 minutes for several hundred potential contingencies. AEP has a robust, NERC-compliant operator training and development program that ensures operators can address any condition on the system.

All switching orders will be issued by AEP TDCs in coordination with other regional authorities as required. Switching and tagging procedures are well-documented in the AEP Transmission and Distribution Switching and Tagging Policy document. This document is issued by the AEP Transmission and Dispatch organizations and gives AEP the ability to produce reliable, efficient and uniform day-to-day operation of the company's electrical facilities without compromising safety.

Transmission Facility and Equipment Maintenance

AEP's EHV system, which was put in-service between the late 1950s and the mid-1970s, is still operating reliably – providing evidence of successful AEP's maintenance practices. AEP has been operating and maintaining transmission facilities for over 100 years.

AEP's Transmission Field Services organization handles all planned field maintenance and emergency repairs. AEP has a staff of over 700 Transmission Field Operations personnel. All internal personnel are trained to AEP standards, follow approved procedures and are among the most highly trained and skilled in the industry. AEP maintains a state-of-the-art transmission training facility staffed with experienced training coordinators to provide the required technical training for all transmission line, station and P&C maintenance personnel. The A. Ray King Transmission Training Center in Pataskala, Ohio is the only dedicated transmission training center in the eastern United States with a functioning low-voltage indoor transmission substation training facility. The center features an outdoor transmission line training area where classes train on the same structures found on the live AEP system. Safety & Health training and testing are also a big part of the program.

AEP has a robust asset lifecycle maintenance program that includes a complete set of inspection and maintenance policies, procedures, guidelines, and plans that reflect its extensive experience and strong compliance culture. This program incorporates a multitude of factors including asset age, performance, real-time monitoring results, periodic test results, and operating conditions into a multi-year plan to properly inspect and maintain all equipment. Real-time monitoring of critical network components coupled with regular inspections to evaluate the physical and operational condition of transmission lines, ROW clearances, and station equipment provide valuable information that informs preventive, predictive and corrective maintenance activities.

AEP's structured preventive maintenance plans result in AEP completing maintenance on approximately 80 EHV circuit breakers, 75 EHV transformers, and over 300 EHV protective relay schemes annually. AEP also inspects over 8,000 miles of EHV lines and performs the requisite maintenance as determined by the inspections. AEP's structured EHV ROW vegetation management has resulted in only one tree contact with an EHV line from inside the ROW since 2008 and no tree-related outages during storms since 2008. Inspections can also reveal certain trends, such as increasing structure deterioration or excessive compressor run times. This data allows for future planning, budgeting and scheduling of resources to forestall critical situations.

AEP's predictive maintenance takes advantage of non-intrusive methods of testing, like infra-red or dissolved gas analysis, to measure the condition of associated equipment. This program has been identified by several utilities as an important step to assist in the implementation of a Condition Based Maintenance Program and has demonstrated the ability to avoid future costly O&M and capital expenditures through the early detection of problems using the use of a predictive maintenance program. AEP also has multiple oil labs for performing timely, detailed Dissolved Gas Analysis and Total Concentrated Gas analysis to supplement field tests.

Transmission Line inspection procedures are documented in the Transmission Line Inspection Guide, which covers components including wood poles, wood cross arms, guys, anchors, lattice structures, steel poles, concrete poles, insulators, aerial crossing markings, FAA warning systems, conductors and shield wires, clearances to vegetation and grounding systems.

Compliance, Physical Security and Cyber Security

Transource will follow AEP's comprehensive approach to compliance, physical security and cyber security. The AEP Reliability Compliance Program provides the framework to assure compliance with NERC and regional entity reliability standards. AEP complies with all reporting and disclosure requirements, local laws and regulations, OSHA and other safety and health regulations, and emergency regulatory activity. AEP has completed and passed many NERC Regional Entity audits and performs annual self-certifications.

AEP addresses physical security by requiring company facilities to have restricted access appropriate for job level, task-appropriate surveillance, log-in and log-out procedures, and routine patrols by security staff. Key facilities are constructed to meet NERC CIP standards for site hardness and

redundancy of critical operating systems. Operations facilities are fully redundant and located in separate areas of AEP's territory. Job sites are generally in the care of a responsible contractor, who has agreed to abide by AEP security standards regarding safety, access and responsibility for materials. AEP Standards are also being revised to address security issues like sabotage. AEP is a member of organizations that provide assistance to restore damaged transmission facilities in the event of a terrorist attack.

Cyber Security Engineering & Standards ensure that AEP's systems have information security controls and appropriate mitigations to protect business functions, operating functions and critical cyber systems. Systems are continuously monitored by cyber security professionals, and staff receives security training at regular intervals. Cyber Security Operations & Analysis partners with the Department of Homeland Security and the Department of Energy in developing public/private information sharing models that will further enhance AEP's cyber security capabilities.

Experience Adhering to Standardized Construction and O&M Practices

AEP has a long history of adhering to standards in building transmission facilities. During its 100+ year history, AEP has developed an extensive list of standards that cover all aspects of transmission engineering, design, operations, maintenance and compliance. As outlined in Appendix B, AEP has over 500 standards that it utilizes every day across the life cycle of transmission assets to plan, design, construct and operate a reliable transmission system. AEP employs these standards on every project to provide cost-effective solutions in an efficient and effective manner. AEP also requires its contractors to adhere to these same standards, thus ensuring that facilities are built to the same exacting standards regardless of the resources completing the work.

AEP has a strong track record of providing fast, high-quality emergency response based upon structured restoration processes and extensive skills and experience over a wide range of voltages and terrains. AEP has pioneered innovative techniques like the extensive use of helicopters to facilitate the rapid restoration of facilities that are located in difficult terrain. AEP has directly and effectively responded to a wide range of emergencies involving line and station equipment at voltage levels from 69 kV to 765 kV. Key capabilities in this area include:

- Structured emergency and recovery procedures, plans and resources
- In-house expert engineering, project management, procurement, and field services staff to support any size restoration effort
- Established contracts with approved third party contractors (engineering, construction, forestry, right-of-way) firms that have the equipment, manpower and skill sets to complete work efficiently and with high quality
- Five transmission dispatch centers for efficient and effective response, planning, coordination between Transmission Operators, creation of switching orders and clearances
- Spare parts strategically located throughout the AEP service area
- Working relationships with neighboring utilities for assistance and materials if needed
- Member Midwest Mutual Assistance Group (MMAG)
- Part of EEI's Spare Transformer Equipment Program (STEP)

The AEP Transmission Emergency Operating Plan (EOP) provides the planned policies and procedures to guide the response to any emergency affecting a transmission asset. The focus of the EOP is on preventing major power outages of wide extent involving generating plants, transmission lines and bulk power substations that collectively furnish the power to major points of distribution. The EOP addresses several issues as required by NERC and the various Reliability Entities in which AEP operates, including, but not limited to, transmission emergency procedures (e.g., real time loadability issues), major storm restoration and system restoration (e.g., black start).

Transource can draw upon AEP's ample supply of temporary and emergency structures, portable substations, transformers, circuit breakers, etc. for use in emergency situations to minimize service interruptions where alternate transmission facilities are unavailable. This inventory will be available to any Transource asset and can readily be deployed across a wide geographic area. AEP maintains strategic agreements with suppliers like Valmont and Fort Worth Tower to provide expedited fabrication of steel structures should they be needed. AEP also has agreements with suppliers to stockpile wooden poles at strategic locations, and inventories are adjusted annually. AEP is also part of the EEI's STEP and can obtain replacement transformers from across the nation in the event of terrorist attack.

Transource can also utilize the AEP system material inventory, which is a significant benefit when performing major storm restoration. The diversity of AEP operating areas typically limits system-wide exposure to major storms, so when a storm impacts one region, materials and supplies can be accessed from other regions, which can improve the speed in which restoration occurs.

For example, on June 29, 2012, AEP's eastern operating companies experienced a derecho storm (a widespread, long-lived, straight-line windstorm with winds that can exceed 100 miles per hour). This storm impacted over 260 transmission circuits, over 420 transmission stations, and more than 500 transmission poles, causing almost 1.5 million customer outages. Due to ongoing AEP transmission construction and maintenance activities, construction materials already in inventory were used during the restoration. Without the availability of the existing inventory, outside material suppliers would have been challenged to supply the needed materials as quickly. The existing inventory, combined with outstanding relationships with AEP material suppliers, prevented material issues from hindering the restoration of this unprecedented storm.

AEP also initiated the implementation of an Incident Command System (ICS) in 2014. The ICS will enhance AEP's emergency response capabilities by providing additional tools to implement a structured approach to handling emergency responses on the AEP system. Its structure will be similar to those used by the military, emergency response organizations, local and state organizations and other utilities. ICS will enhance AEP's capabilities in the following areas:

- Establishes consistent roles and responsibilities
- Separates and defines key restoration roles (operations, planning, logistics, finance and safety)
- Limits spans of control
- Clearly defines and limits the focus of employees' responsibilities during restoration/emergency response
- Provides standardized terminology that will allow for effective and efficient communication internally and with external stakeholders
- Helps AEP staff support each other efficiently and effectively regardless of the incident or size of the storm event
- Helps AEP to easily transition employees throughout our system during events

ICS is part of a larger Emergency Response Plan (ERP) that is expected to be activated in 2015 and completed in 2016.

Experience Working in the Geographical Region

As one of the largest transmission owners in Virginia and West Virginia, AEP has extensive experience in working in successfully siting and permitting electric transmission projects. As mentioned above, AEP owns over 6,000 miles of transmission line in these states.

In recent years, AEP has successfully sought and obtained certificates of convenience and necessity (CCN) and certificates of public convenience and necessity (CPCN) from the West Virginia Public Service Commission and the Virginia State Corporation Commission, respectively, authorizing the construction of over 30 transmission projects with voltages of 138 kV, 230 kV, 345 kV, 500 kV and 765 kV, including a 90-mile interstate 765 kV EHV transmission line.

AEP maintains a website of current transmission projects under development at www.aeptransmission.com, including several projects under development in Virginia and West Virginia. Current projects under development include the Cloverdale Transmission Project, which involves the construction of a new 500 kV substation and upgrade of the existing 765 kV station and the construction and relocation of several 500 kV lines at a projected cost of $237 million. In addition, the Kanawha Valley Improvement Project in West Virginia involves an extensive rebuild of several 138 kV lines at a projected cost of $337 million. These projects are similar or larger in scope to the Meadowbrook to Doubs 230 kV Project and demonstrate AEP's capability to successfully develop large transmission projects in the region, including EHV projects.

Experience Acquiring Rights-of-Way in the Geographic Region

Transource will use AEP's extensive experience in directing and performing all land and rights-of-way functions across its 11-state service territory for this Project. These functions include route consultation, title searches, right of entry, appraisal, negotiations, condemnation support, construction consultation, and damage settlement. AEP uses a combination of internal right-of-way agents, as well as numerous external regional and national firms, to provide these services for all AEP projects. This

extensive network of resources provides relevant experience coupled with deep local knowledge that is vital for success to projects across the nation. For this Project, AEP will use external firms that have extensive experience providing ROW and land acquisition services in northern Virginia and West Virginia. AEP has longstanding relationships with four firms – [REDACTED] – that have extensive experience providing ROW and land acquisition services to a wide variety of industry and organizations in Maryland, Virginia, and West Virginia. These companies operate in multiple states, have experienced and knowledgeable staff, and have proven track records to cost-effectively provide these services with a high level of quality.

Financing Plan

Transource and its subsidiaries are backed by the significant financial strength and experience of its investment-grade owners, AEP and GPE, which have combined assets totaling approximately $66 billion and well-established relationships with more than 40 banks specializing in the financing needs of the energy generation and delivery industry. In particular, AEP has been highly active in the capital markets, successfully raising approximately $8.2 billion in debt since the start of 2011. Specifically, Transource successfully established a $350 million construction financing in the fall of 2013 for its two projects under construction in Missouri.

Transource will leverage this vast network of resources to optimize the cost of capital and reduce the impact on the customer. A likely scenario is that Transource will enter into an agreement with a syndicate of lenders that will be used for the Project during the construction period. Once the Project is complete, Transource will likely seek to refinance the construction debt with traditional long-term debt in the capital markets. During the construction period, the equity capital for Transource will come from internally generated cash flows and from equity contribution from its owners, AEP and GPE.

Transource will target investment grade credit quality for Transource and its subsidiaries. This is done to support steady access to capital markets that is necessary to raise the significant amount of debt that will be needed for the Project at cost-effective rates. The investment grade quality would also result in lower cost borrowing costs compared to non-investment grade credit quality.

Transource's Managerial Ability to Contain Costs and Adhere to Construction Schedules

In terms of providing oversight to manage the overall project, Transource plans on utilizing internal AEP project management resources. AEP employs more than 100 professionals in its transmission project and construction management organizations. These organizations annually manage more than 100 large projects with a combined value of over $1 billion. AEP's substation and line project managers are capable of executing projects of varying complexity from small projects, like the addition of circuit breakers, to large projects, such as the construction of over 280 miles of 765 kV line in mountainous terrain.

Utilizing prudent project management processes and guidelines for executing, monitoring and controlling projects, AEP project managers have demonstrated the ability to consistently deliver projects on time and within budget. Using AEP Transmission's structured Project Lifecycle Management Process (PLMP), these managers use Project Management Plans to proactively manage the project's scope, cost and schedule performance. Key Project Performance Indicators are used, along with resource loaded schedules, to provide the tools necessary for the project and construction managers to successfully complete their projects in accordance with approved timelines and budgets.

A few examples of AEP's recent projects delivered on-schedule and within budget include the following:

- AEP managed the construction of approximately 465 miles of double-circuit 345 kV lines and 16 substations and the acquisition of rights-of-way across 578 tracts of land, coordinating efforts between multiple right-of-way agencies, construction companies and suppliers for the Competitive Renewable Energy Zone (CREZ) projects in Texas. AEP simultaneously constructed the line in sections while managing it as one project to ensure completion of this exceptional project within the project schedule. AEP Transmission's $1.5 billion investment in the CREZ program makes it the largest transmission project in AEP history.
- AEP managed the reconductoring of approximately 216 energized miles of 345 kV transmission lines in south Texas, interfacing with engineers, government entities, right-of-way agents, construction contractors, city, state, and local authorities.

- AEP managed the construction of a new transmission substation near Sunbury, Ohio. The 765/345/138 kV Vassell Station is a major transmission reinforcement effort to help AEP maintain transmission reliability in central Ohio.

C. Proposed Project Constructability Information

[REDACTED]

APPENDIX A - AEP TRANSMISSION REPORT

AVAILABLE UPON REQUEST

APPENDIX B - AEP STANDARDS AND PRACTICES

[REDACTED]

TRANSOURCE ENERGY, LLC
1 Riverside Plaza
Columbus, OH 43215
P 614-716-2884
E info@TransourceEnergy.com
www.transourceenergy.com