

**PJM RTEP – 2014 Project Proposal Window 1:  
Lorain Proposal**

**A Proposal to PJM Interconnection, Submitted July 28, 2014**

Submitted by

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## 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 Project Proposal Window 1 (Thermal Baseline Contingency, Generator Deliverability & Common Mode Outage, Load Deliverability and N-1-1 Thermal)*. This Proposal details a proposed solution to one or more potential violations on facilities referenced in the *Problem Statement & Requirements Document*, dated June 27, 2014. 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 POWER Engineers, Inc. (“POWER”), a nationally recognized leader in infrastructure design and project management, in the development of this Proposal. The constructability work contained in this Proposal was performed primarily by experienced AEP engineering personnel. POWER has worked with Transource to review this cost, schedule and constructability analysis. PJM can have confidence knowing that this key information was reviewed by POWER, a firm that brings a wealth of knowledge and experience designing 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% of Transource, and GPE owns 13.5%. 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.

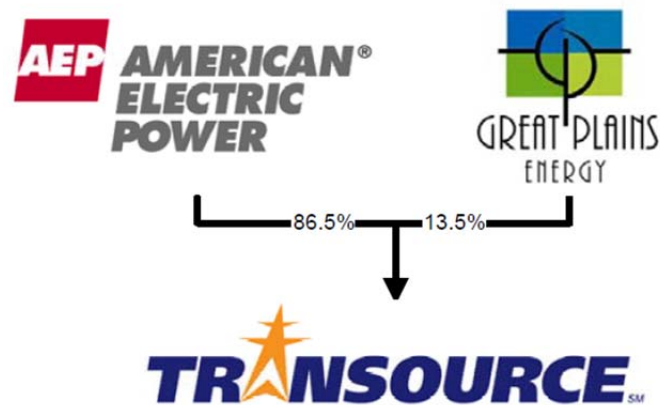


Figure 1-1 Summary of Transource Ownership Structure

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.

Figure 1-2 provides a snapshot of the states in which Transource's owners, AEP and GPE, currently own or are developing transmission assets.

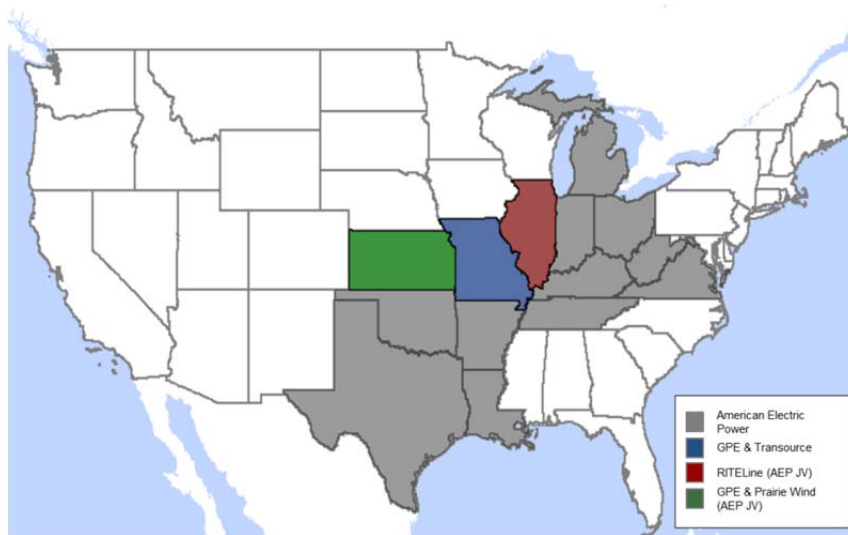


Figure 1-2 Combined Transmission Presence

## The Proposed Project

Transource submits the following proposal to address eight planning criteria violations involving the Black River - Lorain 138 kV line and/or the Avon Lake 345/138 kV Transformer 92, as listed below:

Description of Event (Contingency ID)	Black River - Lorain 138 kV Loading	Avon Lake 345/138 kV Transformer 92 Loading
<b>Generation Deliverability Violations</b>		
Lake Avenue – Avon Lake 345 kV #1F and #2F (tower outage) ( C5-TWL-NR054A)	171.62%	
Lake Avenue – Avon Lake 345 kV #1F and #2F (breaker failure) ( C2-BRK-NR125A)	171.62%	
Avon Lake 345/138 kV 92 transformer, Avon Lake generating unit #9 and Avon Lake – Juniper 345 kV (breaker failure) ( C2-BRK-NR04A)	121.31%	
Lake Avenue – Avon Lake 345 kV 2F and Avon Lake 345/138 kV transformer 91 (breaker failure) (C2-BRK-NR126A)	103.23%	
Lake Avenue – Avon Lake 345 kV #2F and Avon Lake transformer #91 (breaker failure) (C2-BRK-NR127A)	117.69%	106.51%
<b>N-1 Violations</b>		
Lake Avenue – Avon Lake 345 kV #1F and #2F (tower outage) ( C5-TWL-NR054A)	111.13%	
Lake Avenue – Avon Lake 345 kV #1F and #2F (breaker failure) ( C2-BRK-NR125A)	111.13%	
Lake Avenue – Avon Lake 345 kV #2F and Avon Lake transformer #91 (breaker failure) (C2-BRK-NR127A)	106.57%	

To address these planning criteria violations, Transource proposes to build the “Lorain Project” (or the “Project”). The Project relieves the loading on the constrained Black River – Lorain 138 kV line and Avon Lake 345/138 kV Transformer. The Project includes the following facilities in an urban area:

- A new substation south of the existing Lorain station (near Avon, OH). This new substation will be configured in a single line, single breaker configuration. It will have two 345 kV breakers, six 138 kV breakers and two 345/138 kV transformers.
- Approximately six miles of new, double circuit 345 kV line to connect the new substation to the existing Lake Avenue station (near Vincent, OH)

- Extend the existing Avon Lake – Crestwood – Fowles 138 kV circuit and the Avon Lake – Lorain – Slater – Crystal – Fowles 138 kV circuit into this new station via two new double circuit 138 kV lines. The proposed station location is approximately 500 feet from these existing 138 kV lines.
- Remote end relay work

A one-line diagram of the Project is provided as [REDACTED]

Figure 1-3. An aerial map is provided as 1-4. Please note that this Proposal contains multiple graphics that are available in high resolution format upon request.

[REDACTED]

Figure 1-3 One-line Diagram

[REDACTED]

Figure 1-4 Aerial Map of the Proposal

Transource has collaborated with POWER to complete the necessary preliminary project development work to determine project constructability, preliminary cost estimates and a construction schedule. This work was performed primarily by experienced AEP engineering personnel and reviewed by POWER. The estimated capital cost of the Project is \$38.3 million. This estimated cost includes all components of the Project, including those that may be considered as “upgrades” by PJM. The Project is projected to be placed in service in the fourth quarter of 2018.

Attachment 1 of this Proposal includes the required analytical files as set forth in the PJM RTEP – 2014 Project Proposal Window 1 Problem Statement & Requirements Document. Attachment 2 of this Proposal includes the required ‘2014 RTEP Proposal Window Template’. Furthermore, Transource performed analysis of existing and new planning criteria violations that the Project may create and found that the Beaver – Carlisle, Beaver – Lake Avenue #1F and 2F and Hayes – Beaver 345 kV lines are marginally high loaded. All of these lines are terminal equipment limited per “Conductor Ratings\_2012RTEP\_For\_Stakeholders.xls” document provided by PJM. It is recommended that terminal

equipment be upgraded on these lines as part of the Project. Transource has not provided estimates to upgrades terminal equipment as part of this Proposal since scope of work at the incumbent stations is not known. Transource recommends PJM to work with the incumbent to identify scope and estimate associated with the upgrades.

## The Value Proposition

The Lorain Project will provide significant value to electric customers in the service area based on the following factors:

- **The Project addresses eight planning criteria violations with a single, cost effective solution.** The Project relieves the loading on the constrained Black River – Lorain 138 kV line and Avon Lake 345/138 kV Transformer.
- **The Project is constructible.** While in an urban setting, our preliminary analysis suggests that a route which avoids sensitive areas is feasible. Transource will use experienced AEP resources and standard AEP design practices to successfully execute the Project. AEP has experience in executing similar projects located in urban settings.
- **Transource brings the necessary regulatory, technical, financial and operational capabilities to execute the Project.** The Project is near AEP's service territory in northeastern Ohio. This will ensure that there are resources in the vicinity to develop, maintain, operate and restore the Project assets. Additionally, AEP has deep relationships and expertise in working closely with Ohio stakeholders, including regulators, legislators, customers and landowners, to successfully execute projects.
- **Transource presents a clear plan for all aspects of making the Project successful from the time of the designation by PJM through the useful life of the facilities.** Drawing on the vast AEP experience and resources, Transource will use proven tools and practices to meet the cost and schedule objectives of the Project.



## Summary of Project Development & Ownership Plan

Transource will execute the Lorain 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 Ohio.

The most unique aspect of the development plan is securing federal and state regulatory approvals for Transource, a new transmission-only entity in Ohio, 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 in the state of Ohio. These approvals are 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.

The remaining elements of the development and ownership plan for the Project will use AEP's resources and practices that have been proven to be successful for many similar projects. AEP will provide engineering and project management services. AEP will use a combination of internal personnel and experienced third parties for the environmental, siting, permitting and ROW acquisition work; this is a common practice for AEP and AEP's project management team will oversee all of this work. AEP will competitively bid procurement of major materials. Construction services will either be provided by internal AEP personnel or competitively bid to highly qualified contractors. AEP will manage to entire construction process and perform final commissioning work to place the facilities into service.

Upon placing the Project into service, Transource will operate and maintain the new facilities. Again, Transource will use AEP's experienced resources and successful practices. AEP's Transmission Field Services ("TFS") organization will provide field switching, preventive and corrective maintenance, first responder call out services and emergency service restoration for the equipment from the AEP's service locations in Canton, Fostoria and Upper Sandusky, Ohio. The Project is one to one-and-a-half hours from these facilities, which are home to substation, relay and transmission line crews. AEP's Transmission Operations ("TOPS") organization will operate the facilities from AEP's state-of-the-art System Control Center ("SCC") facility located in New Albany, Ohio.



## 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% of Transource, and GPE owns 13.5%. 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 bring to bear 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 eleven 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% of the electricity demand in the Eastern Interconnection and approximately 11% 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.

## **Technical and Engineering Qualifications**

Transource will utilize 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 extra-high voltage 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 –2,022 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 in 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 Lorain Project. AEP is the largest transmission owner in the United States and one of the largest in West Virginia. As shown in the table below, AEP solely or jointly owns over 39,000 miles of transmission line. Of particular relevance to the Lorain Project, over 7,800 miles of the total is at 345 kV and approximately 8,400 miles of the total are located in Ohio.

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 <sup>1</sup> ):	24016	341
AC Lines (100 kV < 200 kV <sup>1</sup> ):	16162	480
AC Lines (230 kV <sup>1</sup> ):	45	195
<b>AC Lines (345 kV<sup>1</sup>):</b>	<b>4356</b>	<b>3453</b>
AC Lines (500 kV <sup>1</sup> ):	0	190
AC Lines (765 kV <sup>1</sup> ):	2047	91
HVDC Lines:	0	0

In addition, as shown in the table below, AEP solely or jointly owns over 4,000 substations, including over 170 at 345 kV.

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 <sup>2</sup> ):	2389	23
AC (100 kV < 200 kV <sup>2</sup> ):	1541	42
AC (230 kV <sup>2</sup> ):	5	1
<b>AC (345 kV<sup>2</sup>):</b>	<b>140</b>	<b>31</b>
AC (500 kV <sup>2</sup> ):	4	0
AC (765 kV <sup>2</sup> ):	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.

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<sup>1</sup> kV level of transmission lines represents design voltage.

<sup>2</sup> kV level of substations represents the high-side terminal design voltage.

<b>In-House Staff &amp; Support Resources (AEP)</b>	<b>Solely Owned</b>
Total number of existing in-house personnel engaged in transmission project implementation and/or transmission facility operations & maintenance <sup>3</sup> :	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 Lorain Project. The following sections highlight AEP’s capabilities and resources in several key areas that are not described in other sections of this Proposal:

### **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.

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<sup>3</sup> In-house staff includes full-time staff, part-time staff, and permanent contractors.

## **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%. 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 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 in Adhering to Standardized Construction and O&M Practices**

AEP has a long history of adhering to standards in the 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 responded effectively 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
- 5 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 in Working in the Geographical Region**

As the largest transmission owner in Ohio, AEP has extensive experience in working in northern Ohio. As mentioned above, AEP owns over 8,400 miles of transmission line in all parts of the state.

This Proposal also includes as Appendix A the 2012 AEP Transmission Outlook Summary Report. This report provides several tables of representative AEP transmission projects, displayed by geographic region. Ten projects in Ohio are highlighted on pages 14 and 15 of the report, including the Amlin and Canton Area Improvements projects that are similar in scope to the Lorain Project (line and station work within urban and suburban areas).

### **Experience in 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 eleven 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 extensive experience coupled with deep local knowledge that is vital for success to projects across the nation. AEP has extensive experience acquiring land and ROW in

Ohio. In the last five years, AEP has provided extensive ROW services in Ohio, performing work on 79 projects, acquiring approximately 2,500 easements and purchasing 64 tracts of land worth over \$7 million.

### **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.



## Details Regarding Construction Cost Cap Provisions

Based upon the analysis performed in this 30-day window, Transource will not propose a construction cost cap provision. Transource is prepared to consider such potential provisions, provided we are granted sufficient time to perform additional due diligence.

## Assumptions

We assume that the extensions of the existing Avon Lake – Crestwood – Fowles 138 kV circuit and the Avon Lake – Lorain – Slater – Crystal – Fowles 138 kV circuit will be designated by PJM to FirstEnergy. In addition, we assume that all work required at the remote end substations will be designated to the owners of those substations.

## C. Proposed Project Constructability Information

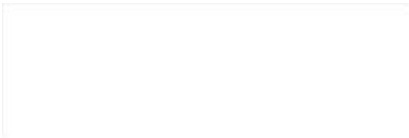
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**APPENDIX A - AEP  
TRANSMISSION  
REPORT**



**APPENDIX B - AEP  
STANDARDS  
AND  
PRACTICES**





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