KgPCo Exhibit No. ___
Witness: PAW

DIRECT TESTIMONY OF
PHILIP A. WRIGHT
ON BEHALF OF KINGSPORT POWER COMPANY
D/B/A AEP APPALACHIAN POWER
BEFORE THE TENNESSEE PUBLIC UTILITY COMMISSION
DOCKET NO. 17-_____

Q. PLEASE STATE YOUR NAME, BUSINESS ADDRESS AND POSITION.

A. My name is Philip A. Wright. My business address is 500 Lee Street, Suite 800, Laidley Tower, Charleston, West Virginia 25301. I am the Vice President of Distribution Operations for Appalachian Power Company (APCo) and Wheeling Power Company (WPCo). I also oversee operations for Kingsport Power Company (KgPCo, Kingsport, or Company) which is registered to do business in the State of Tennessee as AEP Appalachian Power. APCo, WPCo and KgPCo are wholly owned subsidiaries of American Electric Power Company, Inc. (AEP).

Q. PLEASE BRIEFLY DESCRIBE YOUR EDUCATIONAL BACKGROUND AND PROFESSIONAL EXPERIENCE.

A. I earned a Bachelor of Science degree in Electrical Engineering in 1982 from West Virginia Institute of Technology and a Master's Degree in Engineering from West Virginia College of Graduate Studies in 1992. I am registered as a Professional Engineer in West Virginia. I have over three decades of utility experience, focusing primarily on transmission and distribution (T&D) operations. In 1984, I joined APCo as an Electrical Engineer in Beckley, West Virginia. In 1988, I became the Area Supervisor in Oak Hill, West Virginia, and then in 1991 Engineering Supervisor of the Bluefield Division of APCo. In 1992, I was named Bluefield Division's Line Superintendent responsible for the construction and maintenance of the distribution and transmission systems in that area. In 1996, I became the

Operations Manager and, in 2000, Region Support Manager for APCo. I was named to my current position of Vice President of Distribution Operations in September 2005.

Q. WHAT ARE YOUR RESPONSIBILITIES AS VICE PRESIDENT OF DISTRIBUTION OPERATIONS?

A. I have oversight responsibility for the planning, construction, operation, and maintenance of the Company's distribution system. My duties include ensuring the reliable delivery of service to KgPCo's customers and restoring service when outages occur. In addition, my responsibilities include overseeing the Company's distribution vegetation management program and other distribution reliability-related programs.

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A. In my testimony, I give an overview of the Company's distribution system, including recent reliability trends. I then present the Company's proposed Targeted Reliability Plan, including the associated costs and benefits. Finally, I will define the term "major storm," which is used consistently by the Company and provide the level of major storm O&M expense for years 2009 through 2016.

Q. ARE YOU SPONSORING ANY EXHIBITS?

A. Yes, I sponsor the following exhibits:

- KgPCo Exhibit No. 1 (PAW): AEP Forestry – Goals, Procedures & Guidelines for Distribution and Transmission Line Clearance Operations

- KgPCo Exhibit No. 2 (PAW): Programs under Kingsport's Proposed Targeted Reliability Plan - Vegetation Management, Circuit Inspections and Maintenance, Circuit Improvements, Station Improvements

I. DISTRIBUTION SYSTEM OVERVIEW

Q. PLEASE DESCRIBE THE COMPANY'S DISTRIBUTION SYSTEM.

A. The Company serves approximately 48,000 retail customers in the City of Kingsport, Tennessee, and the surrounding communities. Kingsport's service area consists of approximately 297 square miles. The Company's distribution system includes more than 1,570 circuit miles of lines operated at nominal voltages of 34.5 kV or less.

Q. WHAT PROGRAMS DOES KGPCO CURRENTLY HAVE TO MAINTAIN ITS DISTRIBUTION SYSTEM?

A. Kingsport currently has two programs to maintain its distribution infrastructure: 1) a performance-based vegetation management program, and 2) a Reliability and Service Restoration Program.

Q. PLEASE BRIEFLY DESCRIBE THESE PROGRAMS.

A. The Company has been using a performance-based approach to address vegetation issues on its distribution system. However, as I discuss later in my testimony, the Company is proposing to transition from that type of program to a cycle-based vegetation management program. The Company also has a Reliability and Service Restoration Program designed to help prevent non-vegetation customer outages, and to restore service to customers after an outage has occurred.

II. KINGSPORT DISTRIBUTION RELIABILITY

Q. HOW DOES KINGSPORT MEASURE THE RELIABILITY OF ITS DISTRIBUTION SYSTEM?

A. The indices that Kingsport primarily uses to gauge service reliability, which are in general use across the electric utility industry in the United States, are the System Average Interruption Frequency Index (SAIFI) and the System Average Interruption Duration Index (SAIDI). These indices are described as follows in the Institute of Electrical and Electronics Engineers (IEEE) Standard 1366-2012:

- SAIFI indicates how often the average customer experiences a sustained interruption over a predefined period of time. It is the total number of customers interrupted divided by the total number of customers served.
- SAIDI indicates the total time the average customer is without service due to sustained interruptions during the specified period. It is the sum of customer minutes of interruption from each outage divided by the number of customers served.

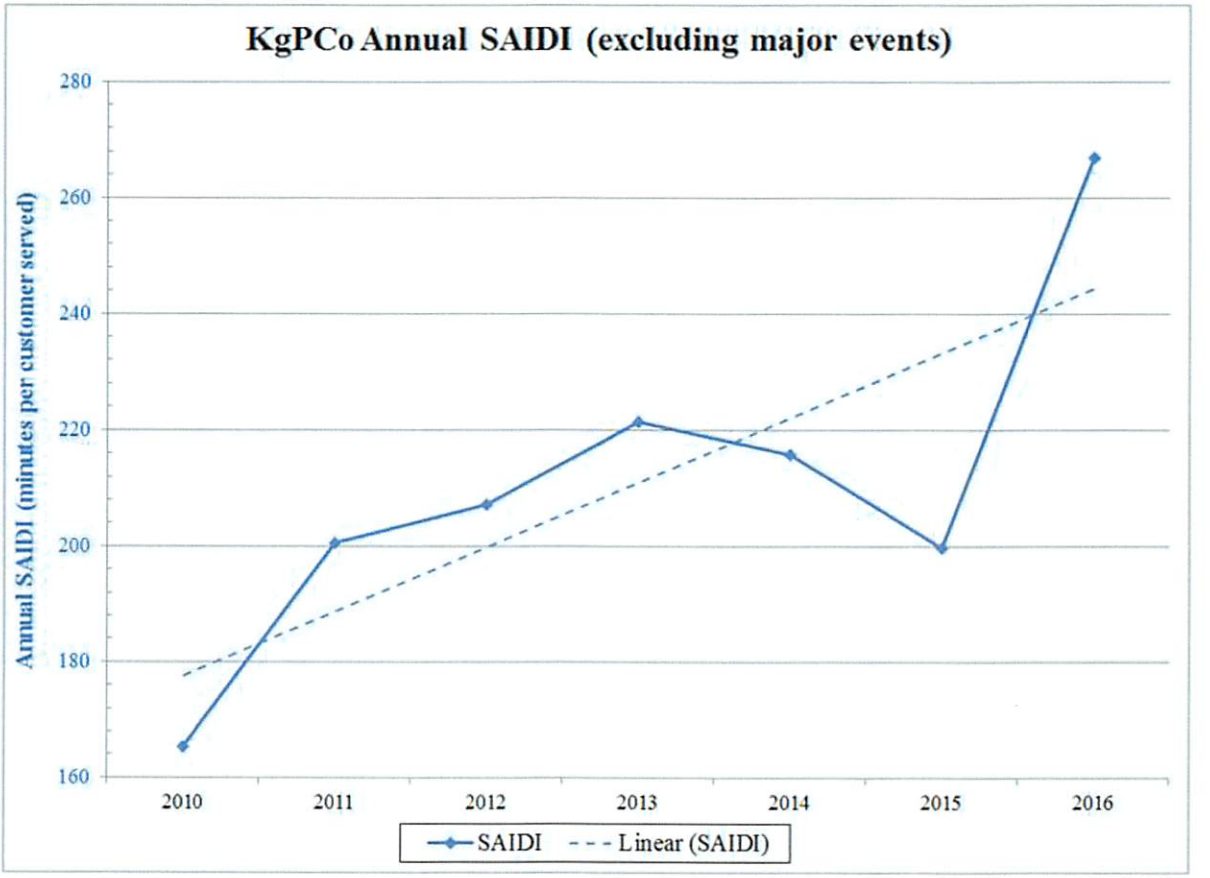
These indices provide insight into how well Kingsport is minimizing service interruptions. For each index, lower values indicate better reliability. Kingsport calculates its SAIFI and SAIDI indices over a 12-month rolling period, excluding major events, to provide a more realistic view of how the system operates during normal operating conditions. Major events represent conditions usually caused by weather that exceed reasonable design and/or operational limits of the electric power distribution system. In instances where the major event is caused by weather, the

Company refers to these events as "major storms." I give more details related to major storms in section VII of my testimony.

Q. PLEASE PROVIDE THE COMPANY'S RECENT SAIFI AND SAIDI INDICES.

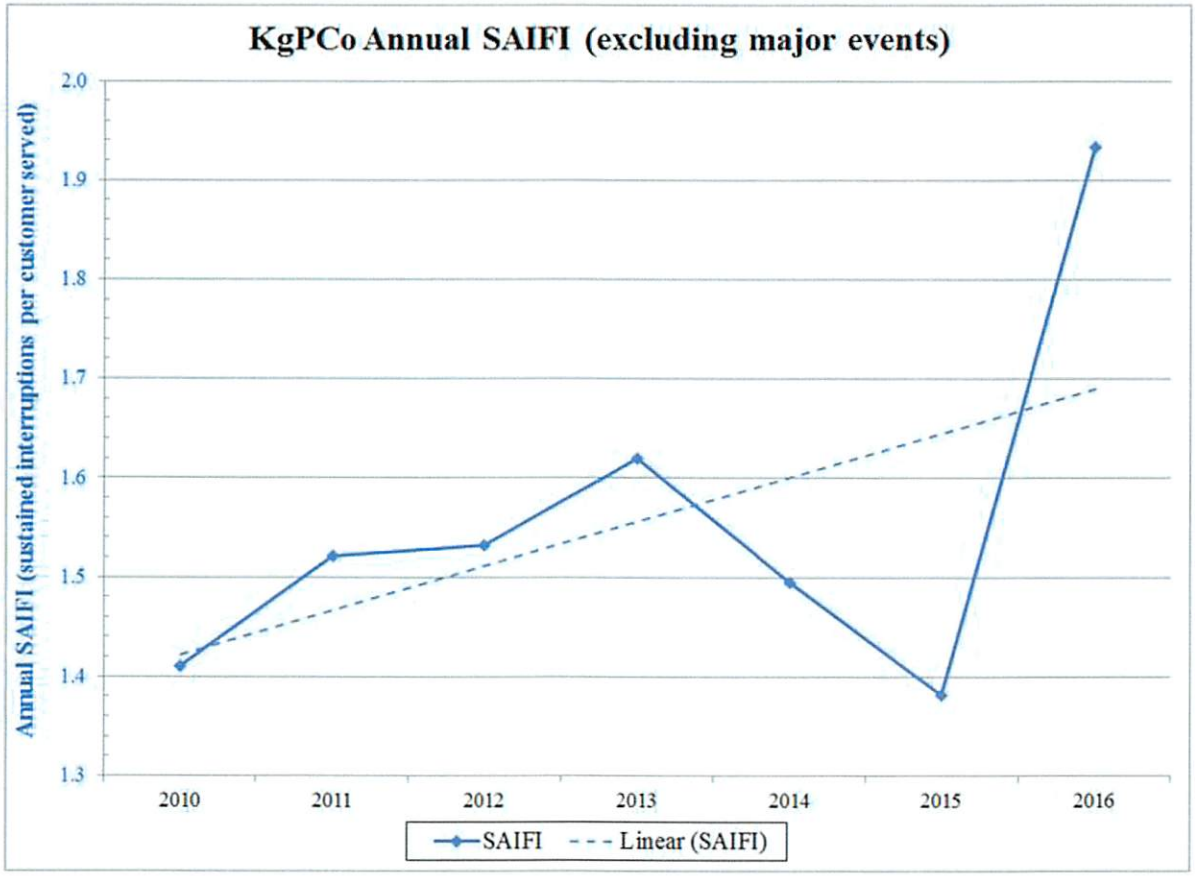
A. Kingsport's SAIDI and SAIFI indices, excluding major events, over the past five years are shown in Figures 1 and 2, respectively.

Figure 1
Total Time Without Service (SAIDI) in Kingsport's Service Territory



For the twelve months ending December 2016, the Company's SAIDI index was 266.9, meaning that, on average, the Company's customers experienced 266.9 minutes without electricity during that time period.

Figure 2
Customer Interruptions (SAIFI) in Kingsport's Service Territory



For the twelve months ending December 2016, the SAIFI index for the Company was 1.93, meaning that, on average; the Company's customers experienced 1.93 outages during that time period (an outage is defined as an interruption of service lasting longer than five minutes). As can be seen from these figures, there has been an increasing trend in both the number of service interruptions and the time without power experienced by Kingsport's customers.

Q. OVER THE PAST FIVE YEARS, WHAT HAVE BEEN THE PRIMARY CAUSES OF OUTAGES FOR KINGSPORT?

A. The major causes of customer service interruptions in Kingsport's service territory, as they relate to SAIDI and SAIFI, are shown in Figures 3 and 4, respectively.

Figure 3
Principal Outage Causes in Kingsport's Service Territory
As a Percentage of SAIDI (Excluding Major Events)

Cause	2012	2013	2014	2015	2016	Average
Veg Inside/Outside	36%	31%	42%	40%	40%	38%
Equipment	24%	20%	21%	25%	18%	21%
Scheduled	10%	16%	16%	13%	13%	14%
Vehicle Accident	10%	9%	7%	11%	7%	9%
Station - Distribution	6%	8%	4%	3%	5%	5%
Lightning	8%	5%	1%	3%	7%	5%
Animal	2%	2%	3%	2%	2%	2%
All Other Causes	6%	9%	6%	3%	8%	6%

Figure 4
Principal Outage Causes in Kingsport's Service Territory
As a Percentage of SAIFI (Excluding Major Events)

Cause	2012	2013	2014	2015	2016	Average
Veg Inside/Outside	29%	23%	35%	33%	28%	29%
Equipment	26%	21%	25%	29%	20%	24%
Scheduled	12%	16%	14%	17%	11%	14%
Vehicle Accident	11%	11%	8%	10%	9%	10%
Station - Distribution	9%	7%	4%	5%	5%	6%
Lightning	5%	6%	1%	1%	6%	4%
Animal	3%	3%	5%	3%	3%	3%
All Other Cause	6%	13%	7%	2%	17%	10%

Over the five-year period (2012-2016), vegetation both inside and outside of the rights-of-way (ROW) and equipment failures have consistently been the leading causes of outages. Vegetation both inside and outside of the ROW combined to account for roughly 38 percent of overall SAIDI with over 26 percent being attributed to vegetation inside the ROW and nearly 12 percent being attributed to

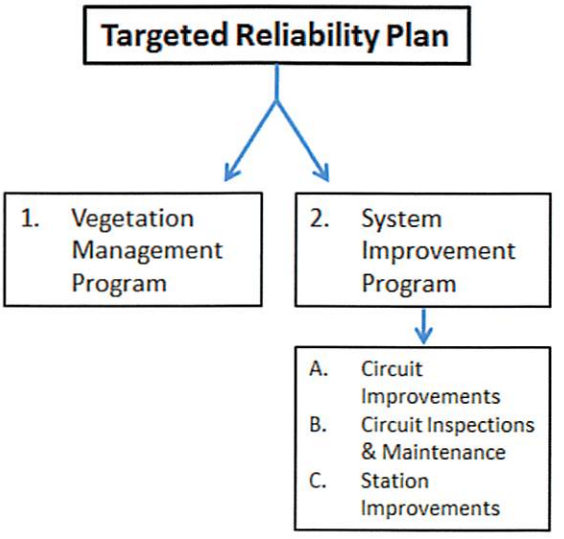
vegetation outside the ROW. Equipment failures follow vegetation as the second leading cause of outages at over 21 percent for SAIDI. Equipment failure is related to items such as cutouts, arresters, insulators, wire, splices, connectors, and fuses. While these items, along with others, are currently addressed as part of the Company's existing Reliability and Service Restoration program, the Company's proposed Targeted Reliability Plan (TRP), which I describe in more detail below, would add significantly more resources to further address these items.

III. KINGSPORT'S TARGETED RELIABILITY PLAN

Q. WHAT DOES THE COMPANY PROPOSE TO IMPROVE ITS CURRENT LEVEL OF RELIABILITY?

A. The Company proposes to implement the TRP, composed of the following programs, as shown below in Figure 5.

Figure 5



The Company's proposed TRP would implement two key changes to its current distribution operations in order to improve reliability, as measured by SAIDI and SAIFI, and provide benefits to its customers. First, as part of its TRP, the Company is proposing to implement a cycle-based Vegetation Management Program (VMP) for its service territory. Specifically, the Company is proposing to transition to a four-year, on-going vegetation management cycle. The second part of the Company's proposed TRP, the System Improvement Program, focuses on three aspects of system improvement: Circuit Improvements, Circuit Inspections and Maintenance, and Station Improvements.

IV. VEGETATION MANAGEMENT PROGRAM

Q. PLEASE COMPARE THE COMPANY'S CURRENT VEGETATION MANAGEMENT PROGRAM TO THE PROPOSED VEGETATION MANAGEMENT PROGRAM UNDER THE TRP.

A. The Company's present vegetation management program uses a performance-based approach to allocate resources to particular circuits, or portions of circuits. Under this approach, the Company concentrates on its worst performing circuits, all or portions of which are managed to reduce the frequency or length of outages.

The proposed VMP is more proactive in nature than the current performance-based approach. Each of the Company's circuits will be managed, end-to-end, on a prescribed cycle. The proposed VMP will transition the Company to a four-year, on-going vegetation management cycle for all of its distribution circuits.

Q. WHY IS THE COMPANY PROPOSING TO IMPLEMENT A CYCLE-BASED VMP?

A. As previously discussed, vegetation is the number one cause of outages for the Company's customers. Similar programs, implemented by KgPCo's sister companies, have demonstrated that managing vegetation on a four-year, on-going vegetation management cycle reduces outages and provides significant benefits for customers. The Company's proposed VMP is designed to move KgPCo to a four-year cycle-based vegetation management approach across its service territory.

Q. WHAT IS THE SCOPE OF THE COMPANY'S PROPOSED VMP?

A. The vegetation on each Kingsport distribution circuit will be managed end-to-end, over an initial transition period of approximately four years, to a four-year, on-going vegetation management cycle. The Company's contractors will apply typical vegetation management practices, discussed in detail in KgPCo Exhibit No. 1 (PAW), "AEP Forestry – Goals, Procedures & Guidelines for Distribution and Transmission Line Clearance Operations," to prune and remove trees, clear brush, and apply herbicides. In addition to the planned maintenance work, specific locations of concern will continue to receive special attention, as they do today, through such practices as hot-spotting.

The transition is designed to optimize resources, to account for contractor availability, and to manage costs. The implementation of the VMP will require additional contract vegetation management resources as well as additional oversight employees. The Company envisions a gradual ramp-up of resources over the first year of the VMP as the most efficient method to increase staff, train additional crews, and assist in alleviating potential resource constraints. This additional work force will contribute to Kingsport's local economy. The time frame Kingsport has proposed

utilizes resources that are anticipated to be available to enable the Company to minimize costs.

Q. HAVE THE CUSTOMER BENEFITS OF A FOUR-YEAR VEGETATION MANAGEMENT CYCLE BEEN DEMONSTRATED IN ANY OTHER AEP SERVICE TERRITORIES?

A. Yes. APCo began the implementation of a system-wide, four-year, ongoing vegetation management cycle program, with a six-year transition period, in its West Virginia service territory in 2014. As of the end of 2016, circuits that had been managed end-to-end had already shown an average improvement in vegetation-related SAIDI of approximately 46 percent and an average improvement in vegetation-related SAIFI of approximately 45 percent. This information was filed with the Public Service Commission of West Virginia on March 1, 2017, in Case No. 17-0280-E-P.

In addition, in 2015, APCo completed a four-year cycle-based vegetation management pilot program on 30 circuits in its Virginia service territory. A comparison of recent vegetation-related reliability of the Pilot circuits, to the historical period prior to implementation of the Pilot (2008 through 2012), indicates that the Pilot circuits experienced significant vegetation-related improvements in SAIDI of 35 percent and in SAIFI of 44 percent through 2016. This information was filed with the Virginia State Corporation Commission (SCC) on March 31, 2017. APCo has pending before the SCC, in Case No. PUE-2016-00090, a request to expand its cycle-based vegetation management program across Virginia.

Kingsport projects comparable improvements in its SAIDI and SAIFI indices if the VMP portion of its proposed TRP is implemented in its service territory.

Q. PLEASE GIVE AN OVERVIEW OF THE PROCESS USED TO ESTIMATE THE COSTS ASSOCIATED WITH THE VMP.

A. The cost estimates are based on various factors such as actual costs, vegetation management contractor rates, and the volume of vegetation management work to be completed. The cost estimates also reflect expected cost increases and include an annual inflation factor for items such as labor and equipment. These values allow the Company to derive the cost of managing vegetation on a per circuit mile basis and form the foundation of the Company's estimates. The average cost to manage vegetation per circuit mile is calculated by taking the total estimated cost of vegetation management expenditures and dividing it by the total number of circuit miles to be completed. The average cost to manage vegetation per mile, used in combination with the total number of distribution circuit miles to be completed annually, provides the basis to calculate the costs to implement the VMP.

Q. WHAT IS THE COST ASSOCIATED WITH IMPLEMENTING THE FIRST YEAR OF THE VMP?

A. The projected cost of implementing the first year (Year 1) of the VMP is approximately $5.45 million, including approximately $3.69 million in total O&M expense and $1.76 million of new capital expenditures.

Q. ONCE THE VMP HAS BEEN IMPLEMENTED, WHAT WILL BE THE ONGOING COSTS TO MAINTAIN THE PROGRAM?

A. The long-term annual costs to maintain a four-year, on-going vegetation management cycle are projected to be consistent with the total costs of the first year post-implementation (Year 5). In year 5, the VMP new capital expenditure is

projected to be approximately $838,000, and the total O&M expense is projected to be approximately $2.51 million. These amounts are also shown in Figure 7 of my testimony.

V. SYSTEM IMPROVEMENT PROGRAM

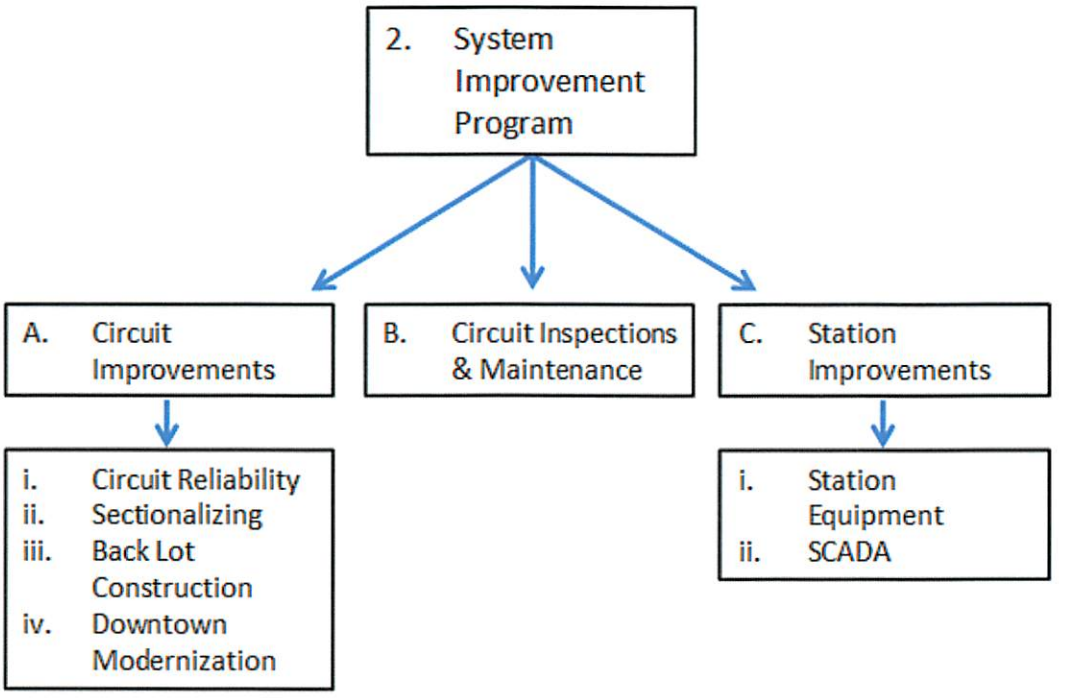
Q. PLEASE DISCUSS THE SYSTEM IMPROVEMENT COMPONENTS OF THE TRP.

A. To address the second most common reliability issue on its distribution system, equipment failures, Kingsport proposes to perform additional circuit inspections and maintenance and make improvements to its circuits and stations. Under the Circuit Improvements category, the following suite of programs will be considered and implemented on a case-by-case basis, depending upon the needs of the circuit coupled with performance, including outage analysis: sectionalizing circuits; back-lot construction; and downtown modernization. Through the Circuit Inspections and Maintenance Program, all overhead facilities and underground structures will be periodically inspected and repaired as necessary. As part of the overhead facilities inspection, wood poles will not only be visually inspected, but some will also be treated and reinforced, as necessary, to extend their useful life while others will be replaced to better withstand storms (*e.g.*, larger poles that are better able to withstand stronger winds). Under the Station Improvements Program, individual Station Equipment Projects will be pursued to rebuild selected stations with structural upgrades to minimize damage and outages as a result of storms. Also, the Distribution Supervisory Control and Data Acquisition (SCADA) will be installed at all sub-stations in the territory, which will allow the system operators to monitor and operate

the system in real-time. SCADA will also help speed up the Company's service restoration response time during outages.

Figure 6 shows the components of the System Improvement Program.

Figure 6



Additional details related to the System Improvement component of the TRP can be found in KgPCo Exhibit No. 2 (PAW).

Q. HOW DOES THE SYSTEM IMPROVEMENT PORTION OF THE PROPOSED TRP COMPARE WITH THE COMPANY'S CURRENT RELIABILITY AND STORM RESTORATION PROGRAMS?

A. With the exception of some of the Station Improvements, the Company is already engaged in many aspects of the System Improvement portion of its proposed TRP.

For example, the Company currently performs circuit inspections and maintenance, as well as circuit improvements. The major difference between what the Company is currently doing, and the System Improvement component of the TRP, is that the Company is proposing to do more up-front; that is, more inspections end-to-end on its circuits, as well as more proactive asset replacement. The Company's current efforts are effective, but they could be performed on a larger scale to address equipment failures, the second largest cause of outages.

In terms of stations, the Company has generally focused on ensuring that its distribution system has enough capacity to serve its customers' energy needs. However, as part of the Station Improvement component of the TRP, the Company is proposing to complete more station-based reliability improvements, such as station rebuilds and reconfigurations, and the system-wide installation of SCADA. Rebuilding stations to withstand more adverse weather conditions and installing a system that will enable the Company to more quickly determine if a station has lost service, will reduce customer outages and improve outage response times.

VI. TRP PROJECTED TIMING AND COSTS

Q. WILL ALL TRP INITIATIVES BE IMPLEMENTED AT THE SAME TIME?

A. No. The Company's plan is to implement its proposed TRP in stages. The first stage of the TRP will focus on vegetation management, circuit inspections and maintenance, and sectionalizing activities under the circuit improvements program. The remaining circuit improvement and station improvement activities will begin in year five (Year 5). Following the end of the tenth-year of the TRP, the Company

estimates improvements to SAIDI and SAIFI of 30 percent and 25 percent respectively, excluding major events.

Q. PLEASE DESCRIBE THE PROJECTED TRP COSTS.

A. Figure 7 summarizes the projected TRP total O&M expense and new capital expenditures per year for years 1-10.

Figure 7

Targeted Reliability Plan - Projected Costs						
TRP Asset Program	Vegetation Management		System Improvement		Totals	
Year	New Capital	Total O&M	New Capital	Total O&M	New Capital	Total O&M
Year 1	$1,760,063	$3,687,750	$1,217,856	$239,471	$2,977,919	$3,927,221
Year 2	$1,795,264	$3,761,505	$1,243,892	$239,695	$3,039,155	$4,001,200
Year 3	$1,831,169	$3,836,735	$1,255,659	$239,882	$3,086,828	$4,076,617
Year 4	$1,867,792	$3,913,470	$1,268,990	$240,075	$3,136,783	$4,153,545
Year 5	$838,125	$2,514,375	$6,238,132	$709,237	$7,076,257	$3,223,612
Year 6	$854,888	$2,564,663	$6,238,132	$709,237	$7,093,020	$3,273,900
Year 7	$871,985	$2,615,956	$6,238,132	$709,237	$7,110,117	$3,325,193
Year 8	$889,425	$2,668,275	$6,238,132	$709,237	$7,127,557	$3,377,512
Year 9	$670,500	$2,721,640	$6,238,132	$709,237	$6,908,632	$3,430,877
Year 10	$683,910	$2,776,073	$6,238,132	$709,237	$6,922,042	$3,485,310
Total Spend	**$12,063,120**	**$31,060,442**	**$42,415,190**	**$5,214,545**	**$54,478,310**	**$36,274,987**

Q. WILL IT BE NECESSARY FOR KINGSPORT TO HAVE A DEGREE OF FLEXIBILITY AS IT IMPLEMENTS ITS PROPOSED TRP?

A. Yes. The TRP was developed based on the best information and data available at this time. However, Kingsport's distribution system is dynamic and the Company recognizes that many factors can precipitate the need to adjust the plan through the years:

- Increased labor demand and specialized skills may cause resource constraints;
- Changing customer needs/expectations;

- Storms affecting Kingsport's service territory or requiring the assistance of Kingsport employees;
- Need to reprioritize projects;
- Economic development opportunities;
- New or updated system and asset information; and
- Knowledge gained while implementing Kingsport's TRP.

As the program progresses, Kingsport will need to be able to respond to these conditions and change its strategy accordingly. This may include the introduction of additional TRP project categories and other assets. This may also include shifting dollars and resources between current TRP project categories (not to exceed total amounts) to address emerging priorities. Allowing the Company flexibility in the implementation of the TRP will provide Kingsport with the tools necessary to allow it to best balance the benefits of the TRP with its cost.

VII. MAJOR STORMS

Q. WHAT IS THE DEFINITION OF A MAJOR STORM?

A. The Company uses IEEE Standard 1366-2012 to categorize major events, which includes major storms. This industry standard uses a statistical methodology to define major event days (MEDs) and differentiate between normal operations and those during major events. The daily SAIDI values for the prior five years are statistically evaluated to determine a daily SAIDI threshold for the upcoming year. If the daily SAIDI for a calendar day exceeds the pre-determined threshold, it is considered a statistical outlier and that day is categorized as an MED. Days below the daily threshold are categorized as days of normal operation. The Company has

excluded outages beginning on the days categorized as MEDs in its presentation of reliability indices. This definition has been consistently used by the Company to develop major storm O&M expense.

Q. WHAT HAS BEEN THE MAJOR STORM O&M EXPENSE FOR THE COMPANY FOR THE PAST EIGHT YEARS?

A. Figure 8 summarizes the Company's major storm O&M expenses during the 2009-2016 period.

Figure 8

Year	Major Storm Expense
2009	$1,932,424
2010	$579,075
2011	$892,759
2012	$406,124
2013	$1,437,600
2014	$83,949
2015	$0
2016	$198,762

As can be seen from Figure 8, major storm O&M expenses are volatile and fluctuate greatly from year to year.

Q. DOES THAT CONCLUDE YOUR DIRECT TESTIMONY?

A. Yes, it does.

File:

AEP Forestry: Vegetation Management Goals, Procedures & Guidelines for Distribution and Transmission Line Clearance Operations

Document #: TVMD-010-04

Effective Date: October 1, 2016

Revision History

Rev.	Description of Change(s)	By	Date	Approved
0	Original Issue			
1	Update		5/14/2009	
2	Update; formatting changes; addition of company specific guidelines; addition of referenced documents table; addition of end notes to link to other documents; review of document performed by Legal;	Kevin Patton	9/10/2014	Walter Sherry 12/14/2016
3	Addition of Transmission Forestry construction clearing guidelines	Kevin Patton	5/1/2016	Walter Sherry 5/4/2016
4	Addition of reporting site location to the guidelines from language that was previously in the rate clarification section of the contract.	Kevin Patton	9/21/2016	Walter Sherry 9/23/2016

Revision Cycle

This document will be reviewed every three to five years depending on the average contract length.

Signatures

Reviewed By

Walter Sherry
Manager, Forestry Operations

27 Sep 16
Date

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Table of Contents

I. Purpose

The purpose of these American Electric Power ("AEP") Forestry Vegetation Management Guidelines is to document and inform AEP employees and its contractors of important criteria, practices, and procedures pertaining to initial vegetation clearing for construction projects and the management of vegetation within rights-of-way. AEP incorporates these guidelines into each vegetation management contract; a copy shall be kept in all vegetation management Contractor's vehicles. These guidelines are to be read consistently with other contract documents by and between AEP and the Contractor. Variances and/or clarifications to these guidelines may be necessary and applied to specific operating companies.

These guidelines contain references to national industry standards; government regulations; and AEP standards and practices. Upon approval of this document, any editions referenced are valid. All standards, regulations and practices are subject to revision. AEP and the Contractor are encouraged to investigate the possibility of applying the most recent editions.

II. Definitions

Brush: Woody stem vegetation less than four (4) inches DBH.

Clearing: The physical cutting and/or removal of woody stem vegetation.

Control: 100% defoliation with no viable buds one year after application; or, on species that require a number of years to achieve control, significant signs of herbicidal activity.

Danger Tree: A tree on or off the right-of-way with the potential to contact electric supply lines.[i]

DBH: (Diameter at Breast Height) The diameter of a tree measured at the height of 4 ½ feet above the ground on the uphill side.

Debris: Vegetative and non-vegetative material such as bottles; cans; wires; paper; branches; or other residue from clearing operations.

Directional Pruning: The removal of limbs in a manner that provides increased conductor clearance and directs growth away from the conductors.[ii]

Hanger: A cut limb left hanging in a tree or on other facilities.

Hazard Tree: A structurally unsound tree that could strike a target when it fails. As used in this clause the target of concern is electric supply lines.[iii]

Log: The merchantable portion of a tree as designated by AEP.

Lopping: The cutting of limbs and slash so that they lie in contact with the ground or as otherwise designated by AEP.

Refusal: A property owner/resident prohibiting the Contractor from managing vegetation as specified within the scope of, and according to, these guidelines and all applicable specifications, permits, and easements.

Removal: The cutting of trees/brush at or near ground line.

Slash: The un-merchantable portion of a tree.

Tree: Woody stem vegetation greater than four (4) inches DBH.

III. Contractor Guidelines

A. Safety

Protecting the safety of all people (Contractors, public, and AEP employees) is of utmost importance to AEP. Contractors shall regard safety as a priority core value; their employees will recognize and follow all laws, rules, and regulations of public and worker safety. Any safety related incidents (e.g. personal injuries, vehicle accidents, outages, flashes, near misses, customer issues, etc.) that occur on the job shall be reported to the proper AEP personnel as specified by AEP management.[iv]

B. Reporting Site

1. The Contractor should establish reporting sites as close as possible to the work.

2. All reporting site locations must be acceptable to the Owner.

3. The reporting site may be relocated if travel time is excessive from the reporting site to the work site and the amount of work exceeds two weeks.

C. Personnel

1. Contractors shall comply with all federal, state and local laws for permits, certifications and licensing requirements necessary to perform vegetation management in specified operating areas.[v]

2. No private work may be solicited or performed by the Contractor or its employees while on AEP time. Contractors shall not seek nor receive compensation from anyone except AEP for any work that is a part of AEP's Forestry Vegetation Management program. The consequences will be crew and/or Contractor disciplinary actions.

D. Equipment

1. Contractors shall provide sufficient equipment in working order to operate their business.

2. The minimum number of chainsaws on the job shall equal the number of personnel on the crew, or as per contract agreement. Chainsaws shall not be billed separately unless approved by AEP Forestry personnel.

3. Each climber shall be provided with a complete set of equipment including: rope, saddle, chainsaw, pruner and handsaw. Each tree crew shall be properly equipped so that, if necessary, a tree rescue can be performed.

4. The use of spurs/climbers/hooks should be avoided.

E. Overtime

Overtime is billable as designated by each operating company.

F. Work Procedures

1. Contractor practices shall be compliant with applicable industry standards (e.g., ANSI, OSHA, and NESC) whenever practical unless the use of such standards increases the risk of injury or property damage.[vi]

2. Changes in the work schedule due to inclement weather, equipment breakdowns, or other circumstances must have prior approval by AEP Forestry personnel.
3. The Contractor will be responsible for the development of a plan to complete the assigned tasks. The plan must meet AEP approval before work begins.[vii]
4. It is the Contractor's responsibility to ensure that the plan is followed, including time estimates to complete the assigned tasks.
5. Contractors shall provide daily work locations to AEP, including changes to these locations throughout the day.
6. Prior to work in any location and before any changes in procedures or activities are made, the Contractor shall perform a job briefing in written/report form to identify all potential work site risks. At least one copy of all documents and reports, including job briefings, shall be prepared in English. [viii]
7. An ongoing list of refusals, scheduled outages, or areas that have not been worked, including reasons, shall be provided to AEP Forestry personnel. Undocumented skips may be worked at the Contractor's expense.
8. Contractor's work should be inspected for clearance and quality compliance on an ongoing basis by the Contractor and AEP Forestry. When an assigned task is complete, the Contractor shall notify AEP Forestry for final inspection.
9. The Contractor shall notify AEP of any hazardous conditions found during the performance of work under this contract.

G. Public Relations

Public relations are important to AEP. Proper notification can eliminate most property owner issues before they arise.

1. When required, an attempt will be made to contact property owners through personal notification, door hangers, news releases, letters, etc. AEP will attempt to contact an absentee landowner only if the landowner provides AEP with a method to contact the landowner.
2. During emergency work, the Contractor will attempt to notify the property owner/resident of the crew's arrival. Discretion should be used during late night or early morning work. If no personal contact is made, a door card may be left to explain the emergency work performed.
3. Contractor shall document all locations where door cards were left, including address and date. A monitored local or toll-free telephone number to reach the Contractor shall be on the door card.

H. Refusals

1. The Contractor shall notify the proper AEP Forester with all pertinent information for all refusals.
2. If the Contractor is unable to resolve the refusal, the refusal shall be turned over to AEP Forestry.
3. Undocumented refusals may be worked at the Contractor's expense.

I. Damage Claims and Complaints

1. The Contractor shall be responsible for all damage claims and complaints due to its negligence. AEP shall be notified immediately of all claims and complaints.[ix]
2. An on-site investigation with the resident/property owner shall be made as soon as possible. A documented attempt to contact the complainant shall be made within twenty-four (24) hours of receipt of the complaint. AEP's representative may accompany the Contractor during the investigation.
3. All valid claims resulting from the Contractor's negligence shall be settled within thirty (30) days by the Contractor, or the Contractor shall provide evidence he is trying to reach a reasonable settlement.[x]
4. The Contractor shall keep AEP informed of the status of all complaints. When a settlement is reached, a written release for both AEP and the Contractor shall be obtained from the property owner/resident.[xi] The Contractor shall provide a copy of all supporting documentation to AEP.
5. If a settlement cannot be reached, the Contractor shall confirm in writing to AEP the final settlement offer and briefly summarize events pertaining to the offer.
6. After thirty (30) days, if a Contractor fails to resolve a claim, does not continue attempts to resolve the claim or keep AEP fully informed, AEP may settle the claim and bill the Contractor.[xii]
7. Costs to restore outages or repair AEP's facilities due to negligence may be billed to the Contractor as determined by AEP.

IV. Performance Guidelines

A. Removals

1. Stumps shall be cut as close to the ground as practical, but not to exceed a three inch maximum height and treated with approved herbicide, unless the situation prevents application according to label instructions; there is a documented customer refusal; or an AEP Forester directs otherwise.
2. Tree removal shall be completed in one operation. If this is not practical, hazardous conditions shall not be left while the work is not actively in progress. Trees shall be removed in a manner to protect electric lines, yards, fences, houses, and other facilities.
3. Targets for removal are:
    a. All trees with the potential of growing into the conductor.
    b. Trees where adequate clearance cannot be obtained using proper pruning practices.
    c. Trees that will take less than three times the amount of time to remove as they would take to prune.
    d. Trees within five (5) feet of poles.
    e. Mature trees where more than 50% of the crown must be removed to obtain clearance.

f. Young, vigorously growing trees where more than 66% of the crown must be removed to obtain clearance.

g. Palm species.

4. At property owner's request, any tree situated such that the location of AEP's facilities impede, or add significantly to the cost of, the safe removal of the tree and an additional burden is placed upon the property owner, AEP should take the steps necessary to mitigate the impediment or to relieve the additional burden placed upon the property owner. AEP actions may include, but not be limited to, moving or protecting its facilities, removing portions of the tree to provide the clearances required by ANSI, OSHA, or any other regulatory authority, to allow removal by "non-line clearance" qualified arborists or non-professionals. Except in case of emergency, AEP must evaluate the property owner's request and prioritize any necessary work according to its benefit to the provision of electric service to all customers. At property owner's request, debris will be left for disposal by the property owner.

5. State and local ordinances shall be obeyed during the disposal of debris.

B. Pruning

1. Contractor practices should be compliant with all applicable industry standards (i.e., ANSI, OSHA, and NESC) whenever practical unless the use of such standards increases the risk of injury or property damage.[xiii]
2. Pruning shall provide at least the minimum specified clearance from electrical conductors as set forth below in Section V. Distribution Clearances or Section VI.C. Transmission Clearances or as designated by the operating company.
3. Reasonable care should be exercised to help prevent the spread of insects and pathogens.
4. Portions of wild cherry, black walnut and other vegetation toxic to livestock (i.e., wilted leaf material) that has been pruned, cut, treated with herbicide, or damaged by the Contractor's activities, should be removed from active pasture areas accessible to livestock, unless agreed to by the property owner in writing.
5. State and local ordinances shall be obeyed during the disposal of debris.

C. Hangers and Cleanup

1. All hangers shall be removed from the pruned tree before leaving the job site.
2. Work sites shall be left in a neat and orderly condition.
3. A minimum amount of cleanup work should be performed. Unless otherwise designated by AEP Forestry, chipping the brush, cutting wood into lengths that can be handled and raking the site is the maximum cleanup that should be performed.
4. All streams and/or drainage ditches shall be kept free of any limbs or woody debris cut by the Contractor.

D. Clearing and Re-clearing

1. AEP will provide the width of the right-of-way.

2. All woody plants that have the potential to grow into and interfere with service reliability; restoration; patrolling; or other maintenance operations of AEP facilities should be controlled by the operating company guidelines.
3. During scheduled maintenance operations, any vegetation adjacent to station facilities that may affect the safe operation of those facilities should be brought to the attention of the proper AEP personnel.
4. Trees, brush, and existing stumps within the right-of-way shall be cut as close to the ground as practical, but not to exceed three inches in maximum height above the ground line. Where possible, the cut shall be parallel to the slope.
5. Trees shall be felled to avoid damage to crops, fences, and other facilities. Any trees felled into crops, ditches, streams, roads, or across fences shall be promptly removed. No trees shall be felled in such a manner as to endanger AEP facilities or the property of third parties, or hinder access along the right-of-way.
6. Trees, brush, and slash shall be lopped as designated by AEP Forestry.
7. Hazard Trees are identified and addressed/worked at the discretion of the individual operating companies or regions. Consideration for hazard tree removal shall be made for those trees that are an immediate threat to AEP facilities. Hazard Trees may include, but are not limited to, trees that have severe lean or sweep; are dead; or have visible defect or damage.
8. Stumps of trees growing in fences may be cut at fence post height. Logs may be left in tree lengths or as designated by AEP Forestry. If so designated, the merchantable value of logs shall be preserved as much as practical.
9. As designated by AEP Forestry, brush and logs may be piled at the edge of the right-of-way for wildlife habitat.
10. Brush and debris from vegetation clearing shall not be left in managed agricultural areas or other maintained areas. Piled and/or windrowed materials shall not be left on or interfere with fences or other facilities of the landowner or AEP unless designated by AEP Forestry.

E. Herbicide Application

1. All woody plants that have the potential of growing into the lines or impair access should be controlled, as designated by AEP Forestry.
2. Contractors are required to maintain accurate and up to date records of all herbicide applications made as required by all Federal, State, and local laws.
3. The Contractor shall be required to control at least 90% or a percentage as designated by operating company of the targeted vegetation. Any areas not meeting the control requirements shall be retreated at the Contractor's expense.[xiv]
4. AEP Forestry may make vegetation management prescriptions in consultation with Contractors.
5. Property owner notification requirements vary by locale. Contractor shall contact local AEP Forestry representative for requirements.[xv]
6. Managers of public rights-of-way involved in the treatment area shall be notified, where appropriate.

7. Contractor shall be responsible for training of herbicide applicators.
8. Unless specifically prohibited by property owners or AEP Forestry, stumps shall be treated with an appropriate herbicide treatment.

F. Tree Growth Regulator Application

1. Trees designated for tree growth regulation shall be treated with an approved tree growth regulator ("TGR") in accordance with label instructions.
2. All trees shall be inspected by the Contractor for health and vigor prior to treatment. Trees found in excessive state of decline shall not be treated unless directed by AEP Forestry.
3. Property owner notification requirements vary by locale. Contractor shall contact local AEP Forestry representative for requirements.[xvi]

G. Vines

Vines shall be cut, **BUT NOT REMOVED** from AEP or other facilities, and treated with an appropriate herbicide as designated by AEP Forestry representative. Pulling/removing vines from the facilities may damage equipment and endanger the employee.

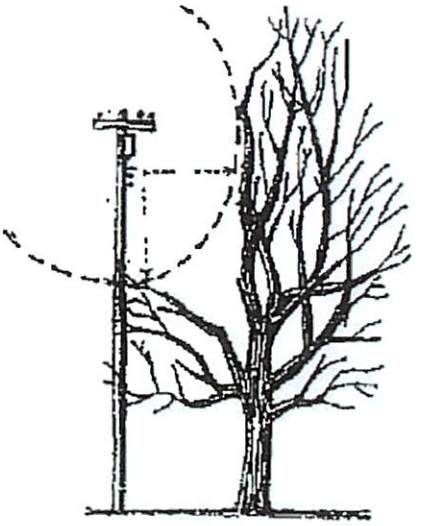
V. Distribution Clearances

Variances to this recommendation may be necessary and applied due to specific operating company guidelines or specific restrictions in permits and/or easements.

Minimum clearance for distribution lines is that distance that will prevent regrowth into any AEP conductors for a minimum of three (3) years. The species, site, limb, conductor sag and sway during windy conditions; and the effect of electrical load should all be considered when determining the clearance requirement.

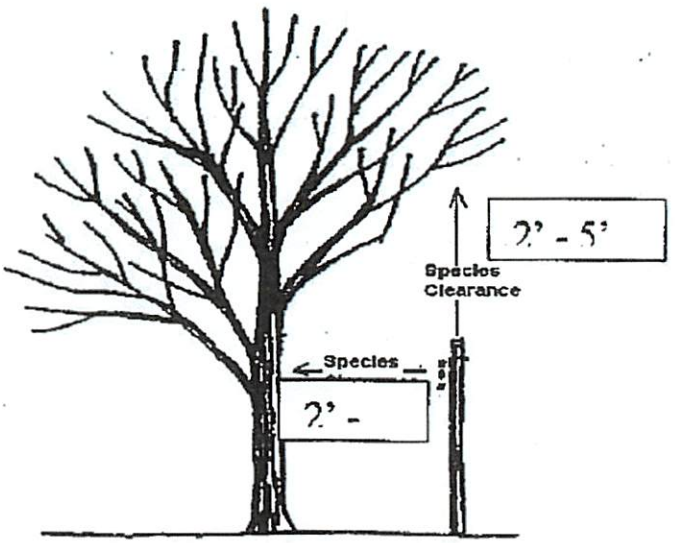
A. Primary Conductors

Limbs should be pruned for a minimum of three (3) years clearance. Overhanging limbs should be removed. Top of tree should be directionally pruned unless prior arrangements have been made with the proper AEP Forestry representative.



B. Secondary Conductors

Limbs should be pruned for two (2) to five (5) feet of clearance without removing overhanging branches unless otherwise specified by an AEP Forestry representative.



C. Service Drops and Street Light Conductors

Trees near service drops and street light conductors will not be pruned unless specified by an AEP Forestry representative. Do not prune for street light illumination except at the specific direction of the proper AEP Forestry representative.

D. Poles and Guys

1. Heavy limbs applying pressure on the span guy should be pruned or removed at the specific direction of the proper AEP Forestry representative.

2. Trees, brush, and slash should be cleared to obtain a minimum of a five (5) foot radius of clearance around the pole or guy unless otherwise specified by an AEP Forestry representative.

E. Vines

Vines shall be cut, **BUT NOT REMOVED** from AEP or other facilities, and treated with an appropriate herbicide as designated by AEP Forestry representative. Pulling/removing vines from the facilities may damage equipment and endanger the employee.

VI. Transmission

A. Hazard Trees

Trees may exhibit potential threats to AEP facilities due to disease, damage, physical location, growth characteristics or environmental problems. Where these trees exist, AEP considers them high priority risks that need to be addressed and remediated.[xvii]

1. Visual Assessment

While performing work on a circuit, contract crews shall conduct a visual assessment to identify trees with imminent[1] and/or probable[2] likelihood of failure inside and outside the right-of-way. The tree should be viewed from some distance away, if possible, to consider crown shape and surroundings.

Any tree identified to be a potential imminent threat to an AEP Transmission line shall be reported to the responsible transmission forester.

2. Ground Evaluation

If a Hazard Tree is identified during the visual assessment, a 360° ground evaluation shall be required. The evaluations should include an inspection of:

- Tree crown
- Trunk
- Trunk flare
- Above-ground roots
- Site conditions around the tree in relation to targets.

The Contractor shall report risk and mitigation options to the responsible transmission forester.

B. Tree Felling

Before beginning any tree felling operation, the Contractor shall consider relevant factors[3] pertaining to the tree and site and shall take appropriate actions to ensure a safe removal operation.[xviii]

1. When there is a danger that the tree pieces or tree being removed may fall in the wrong direction and contact utility facilities or damage other property, appropriate methods shall be used to control the direction of fall.[xix]
2. All limbs shall be removed to a height and width sufficient to allow the tree parts or tree to fall clear of hazards.[xx]
3. Notches shall be used on all trees and trunks greater than five inches DBH.[xxi]

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[1] Imminent – failure has started or is most likely to occur in the near future, even if there is no significant wind or increased load. (Tree Risk Assessment Manual, pg. 100)

[2] Probable – failure may be expected under normal weather conditions within the specified time frame. (Tree Risk Assessment Manual, pg. 100)

[3] ANSI Z133-2012 Annex C.3, Manual Tree Felling Procedures contains a list of relevant factors to be considered during tree felling.

4. Contractors shall provide evidence of training to employees related to tree felling upon request.

C. Clearances

The ultimate goal of vegetation maintenance is to provide for the safe, reliable operation of the AEP transmission system. When performing maintenance, the objective for locations on spans with less than 100' vertical clearance at maximum sag from conductor to ground is the removal of all woody-stemmed vegetation to the appropriate width, leaving the cleared area of the right-of-way populated with grasses and herbaceous growth. Under certain circumstances (unique topographic and/or environmentally sensitive conditions), AEP may allow compatible, low growing species to remain in the right-of-way. In maintained areas (mowed yards, lawns, and public areas), trees deemed compatible with the safe operation of the line may remain, although AEP strongly discourages this practice. Compatible species will be limited to those that grow no more than 15' tall or actively maintained trees that could be considered a crop, such as in nurseries and orchards.

When removal of all woody-stemmed vegetation is not achievable (i.e. there are restrictions), AEP will endeavor to cut or trim so that upon completion of the work no vegetation will be closer to conductors at maximum sag than the distances outlined in Columns A and C. Distances are based on completed work meeting or exceeding the minimum approach distances to energized conductors for persons *other than qualified* line clearance arborists and qualified line-clearance arborist trainees (Columns A and C).

Table 1: Clearance Table Guidelines[4]

Right-of-way No Restrictions	Right-of-way with Restrictions
< 100' Vertical Clearance between Conductors at Maximum Sag and Ground	**< 100' Vertical Clearance between Conductors at Maximum Sag and Ground**
1) Remove all woody-stemmed vegetation	1) Trim or remove vegetation to meet Column C, **Table 2**.
2) Do not allow vegetation closer than Column E, **Table 2**.	2) Do not allow vegetation closer than Column E, **Table 2**.
3) Trigger distances to schedule maintenance per Column D, **Table 2**.	3) Trigger distance to schedule maintenance per Column D, **Table 2**.
> 100' Vertical Clearance between Conductors at Maximum Sag and Ground	**> 100' Vertical Clearance between Conductors at Maximum Sag and Ground**
1) Trim or remove vegetation to meet Column B, **Table 2**.	1) Trim or remove vegetation to meet Column C, **Table 2**.
2) Do not allow vegetation closer than Column E, **Table 2**.	2) Do not allow vegetation closer than Column E, **Table 2**.
3) Trigger distances to schedule maintenance per Column D, **Table 2**.	3) Trigger distance to schedule maintenance per Column D, **Table 2**.

[4] Upon completion of maintenance

Table 2: Transmission Line Clearance Guidelines

Column A	Column B	Column C	Column D	Column E
Nominal Voltage (kV phase to phase)	AEP Clearance 1 (no restrictions) Desired Clearance Between Conductor and Vegetation	AEP Clearance 1 (with restrictions) Desired Clearance between Conductor and Vegetation	ANSI[5] Clearance between Conductor and Vegetation	AEP Clearance 2 between Conductor and Vegetation
765kV	45	35'00"	27'04"	14'00"
500kV	45'	26'08"	19'00"	10'00"
345kV	30'	20'05"	13'02"	7'06"
230kV	30'	16'05"	7'11"	5'02"
161kV	25'	14'00"	6'00"	3'05"
138kV	25'	13'02"	5'02"	2'11"
115kV	25'	12'04"	4'06"	2'06"
88kV	25'	12'04"	4'06"	2'06"
69kV	25'	10'09"	4'02"	2'06"
46kV	20'	10'00"	3'04"	2'06"
34.5 kV	20'	10'00"	3'04"	2'06"
23 kV	20'	10'00"	3'00"	2'06"

D. Transmission Dispatch Communication Procedures

The Contractor shall log on and off transmission circuits per the policy of the responsible Transmission Dispatch Center ("TDC").

E. Transmission Forestry Construction Guidelines

The ultimate goal of vegetation maintenance is to provide for the safe, reliable operation of the AEP transmission system. When performing maintenance, the objective for locations on spans with less than 100' vertical clearance at maximum sag from conductor to ground is removal of all woody-stemmed vegetation to the appropriate width, leaving the cleared area of the right-of-way populated with grasses and herbaceous growth. Under certain circumstances (unique topographic and/or environmentally sensitive conditions), AEP may allow compatible low-growing species to remain in the right-of-way. In maintained areas (mowed yards, lawns and public areas), trees deemed compatible with safe operation of the line remain, although AEP strongly discourages this practice. Compatible species will be limited to those that grow no more than 15' tall or actively maintained trees that could be considered a crop such as in nurseries or orchards.

[5] ANSI Z133-2012.

All removals/trimming shall be done in accordance with the best recognized and approved principles of modern arboriculture and tree surgery, with balanced emphasis on current tree health and clearance.

The full width of the right-of-way, as determined by easement agreements, shall be cleared unless otherwise indicated on the Special Condition List.

Right-of-Way service will provide a contact list and will be handling damages for the construction work. Property owners who were notified of the construction work will receive a follow-up notification from the Contractor tree days before starting work on that property.

1. Contractor Qualifications

Contractor practices shall be in compliance with applicable industry standards (e.g., ANSI, OSHA, NESC) whenever practical unless the use of such standards increases the risk of injury or property damage.

2. Clearing

The right-of-way shall not be cleared with a bulldozer, maintainer, or any other method that will disturb surface or sub-surface conditions unless specified in the right-of-way Special Conditions List. Reduction of disturbance of the surface or sub-surface soils reduces the risks of soil erosion and invasive species.

Contractor will take whatever measures necessary as specified in the SWPPP and elsewhere in the specification to prevent the erosion of soil from the right-of-way. The corrective measures may be in the form of grading, terracing, construction of sediment barriers, reseeding, mulching, or steps necessary to prevent erosions and must be approved by AEP.

Mowed right-of-ways shall be left with no stumps higher than three inches and no large chunks of debris left. Examples of preferred mowing equipment to be used on the right-of-ways will be equipped with, but not limited to, "FECON", "SEPPI" or equivalent type mowing heads.

3. Tree and Brush Removal

1. Trees and brush designated for cutting or mowing on the rights-of-way shall be cut as close to the ground as practicable, but not to exceed three inches in height above the ground line. All trees and brush cut shall be stump-treated with an approved herbicide as instructed on the label. All spraying procedures are to be fully explained to property owners if requested by landowner. If requested by landowner that no herbicides be used, their request is to be referred to Company. Certain state laws and regulations may require consent of the property owner to apply herbicides.

2. On portions of the right of way where the conductor to ground clearance is 100 feet, or less, all woody stemmed vegetation will be cut, limbed and lopped. No vegetation will be permitted to obstruct roads, lanes, trails, fences and streams. The brush shall also be cut and compacted. Additional requirements are:

- Stump surfaces shall be cut parallel to and within three inches of the ground.
- Brush and logs shall not be placed within 25 feet of improved roads, or river and stream banks.
- Brush and logs shall not be piled in flood plains.
- Brush and logs shall not be placed in fields unless authorized by the property owner.

- Brush and logs shall not be placed where it will obstruct ingress or egress on other rights-of-way such as roadways or trails.
- Trees will be felled where possible to protect crops, fences and other facilities.

3. No clearing will be done where the line crosses valleys or ravines when the conductor profile indicates a height of 100 feet or greater above the ground at maximum sag; hence, impacts on streams and woody vegetation in valleys can be avoided or minimized. The exceptions to this are as follows:

- Trees that do not have at least 50' of clearance between conductors and tree under maximum sag conditions will be removed.
- Where a conductor stringing path is specified
- Wire set-up areas
- Work areas, etc.

4. For trees in yards, grind stumps to six inches below grade and restore the ground to match the existing grade and vegetation in the surrounding yard.

5. Low-growing species can be left except in tower locations. All woody stem vegetation within the cleared right-of-way shall be removed on NERC-applicable lines.

6. Any required buffer zones/screens shall be selectively treated in areas designated by AEP. Only tall-growing species (i.e. those trees that will grow taller than 15 feet at maturity) will be cut or treated in these areas.

4. Tree Pruning

Tree pruning will generally be limited to trees on the edge of the right-of-way or in locations designated as environmentally-sensitive; tree pruning will ensure that required clearances are achieved. Pruning shall be done in a manner that protects current tree health and with regard for future growth and development. Manual pruning operations will utilize qualified line clearance arborists, as defined by ANSI Z133.1-2012, and seek to prune trees according to standards set by the International Society of Arboriculture, the American National Standards Institute and the Tree Care Industry Association. Trees will be pruned in accordance with the American National Standard Institute guidelines for "Tree Care Operations – Tree, Shrub, and Other Woody Plant Maintenance – Standard Practices (Pruning), ANSI A300 (Part 1) – Pruning"

5. Debris Disposal

Debris from construction clearing operations is left on the right-of-way to decompose and return nutrients to the soil and to reduce the possibility of soil erosion. Limbs are reduced in size to maintain a low profile, and both the main stem and brush left on the right-of-way.

1. All woody vegetation that falls into roadways, waterways, fences, lawns, or pastures shall be moved to a wooded area of the right-of-way or may, at times, be chipped and/or otherwise removed.

2. Logs may be left in tree lengths or as designated. The merchantable value of the logs will be preserved as much as possible.

3. Alternatives to the debris disposal standard are the following:
   - Cut and Compact: Brush may be reduced in height by cutting and by compacting piles with crawler-type equipment at selected locations (depressions in topography) on the right-of-way outside of the conductor path.
   - Cut and Scatter: Brush may be reduced in height by cutting or scattering on the right-of-way outside of the conductor path or roadway, but as close to the edge of the right-of-way as possible.
   - Cut and Pile: Where required by right-of-way agreement, brush shall be piled or scattered off the right-of-way.
   - Chipping/Shredding: Chipping/shredding or other viable methods may be utilized where accessible by equipment.
   - Burning: brush burning shall only be done if it is specified in the right-of-way agreement and is in accordance with applicable regulations. This method requires formal approval by the Manager of Forestry Operations.

F. Hazard Trees

Hazard trees (outside of right-of-way) will be cut or trimmed and the logs and laps will be left as felled. When the conductor to ground clearance is over 100 feet, only those trees that do not have the required clearance will be cut. Refer to Section VI.A on page 15 for additional information.

G. Herbicide

Application of all herbicides shall be performed as required by federal, state, and local laws. The contractor will furnish and be responsible for all pesticides, including proper disposal of their containers, and insure their use in accordance with the label instructions. All work will be done as defined in Herbicide Application on page 11.

H. Fences and Crops

1. No fences shall be cut unless contractor is authorized to do so by AEP, if fences are cut or broken by the contractor without prior AEP authorization, the Contractor, at their expense, shall promptly repair.

2. Contractor is responsible for the right-of-way clearing needed to perform the job, however, the Contractor agrees to not do unnecessary damage to growing crops or other properties and agrees to pay the tenant and/or landowner involved for any unnecessary damage to growing crops and other properties. AEP shall be the sole judge of what constitutes "necessary" and "unnecessary" damage under the terms hereof.

VII. Appendices

A. Distribution Line Clearance Guidelines

These growth rates and clearance distances are guidelines for the minimum clearances required. These distances are not static and should serve as minimum clearance requirements unless designated otherwise by the operating company. Good soils and high moisture may cause many species to grow faster. These clearance guidelines are not meant as a requirement for all trees on AEP's rights-of-way. It is understood that within maintenance intervals, trees may encroach into these minimum clearance zones. These guidelines are meant to be used as an aid for pruning clearances from AEP facilities.

Table 3: Minimum Clearance from Distribution Conductors

Re-growth Rates	Minimum Clearance from Conductors	Species
Fast	Minimum clearance of 20 feet	Cottonwood Poplar species Silver Maple Sycamore Willow Ailanthus Box Elder Elm species
Medium	Minimum clearance of 15 feet	Locust Red maple species Ornamental pear species Fruit trees (apple, pear, etc.) Pine, Spruce and Hemlock species Sweet gum Catalpa Hackberry Hickory Crabapple Red oak Ash Species Mulberry Bois d'arc (Osage orange, hedge tree)

Re-growth Rates	Minimum Clearance from Conductors	Species
Slow	Minimum clearance of 10 feet	Cedar Chinaberry Magnolia Any small variety species Persimmon White oak (round lobes) (Redbud, dogwood, etc.)

1. Exceptions

1. When the entire trunk of a tree falls within the minimum clearance specifications
2. When less pruning would still provide adequate clearance and an overall healthier tree.
3. As approved by AEP Forestry Representative.

B. Distribution Operating Company Specific Guidelines

1. AEP Ohio
2. AEP Texas
3. Appalachian Power
4. Indiana Michigan Power
5. Kentucky Power
6. Public Service of Oklahoma
7. Southwestern Electric Power Company
8. Wheeling Power

C. Referenced Documents and Specifications

Title	Year	Version	Pages
AEP General Terms and Conditions for Labor and Services. American Electric Power	2012	Revision 2	1-23
AEP Vegetation Management Ground Spray Requirements	2014		1-3
Aerial Patrol Training. American Electric Power	2013	TVMD-015	
American National Standard for Arboricultural Operations – Safety Requirements. International Society of Arboriculture. Champaign, IL	2012	ANSI® Z133-2012	1-71
American National Standard for Tree Care Operations – Tree, Shrub, and Other Woody Plant Management – Standard Practices (Pruning). Tree Care Industry Association. Londonberry, NH	2008	ANSI® A300 (Part 1)-2008	1-13
American National Standards for Tree Care Operations – Tree, Shrub, and Other Woody Plant Management – Standard Practices (Integrated Vegetation Management a. Utility Rights-of-way). Champaign, IL[6]	2006	ANSI® A300 (Part 7)-2006	57-66
American National Standards for Tree Care Operations – Tree, Shrub, and Other Woody Plant Management – Standard Practices (Integrated Vegetation Management a. Utility Rights-of-way). Champaign, IL	2012	ANSI® A300 (Part 7)-2012	1-15
Best Management Practices – Integrated Vegetation Management. International Society of Arboriculture. Champaign, IL	2014	Second Edition	1-44
Best Management Practices – Tree Pruning. International Society of Arboriculture. Champaign, IL	2008	Revised, 2008	1-38
Best Management Practices – Utility Pruning of Trees. International Society of Arboriculture. Champaign, IL	2004	First Edition	1-22
Budget Development and Cost Forecasting. American Electric Power	2013	TVMD-004	
Inspection and Patrol Process. American Electric Power	2013	TVMD-003	
Managing Clearance Restrictions. American Electric Power	2013	TVMD-005	
Managing Hazard Trees on FAC-003 Applicable Circuits. American Electric Power	2013	TVMD-006	
Risk Assessment & Procedures. American Electric Power	2013	TVMD-014	

[6] Definition of Danger Tree and Hazard Tree were removed in the 2012 revision.

Supplementary Terms and Conditions for Forestry Contracts. American Electric Power	2011		1-11
Tree Risk Assessment Manual. International Society of Arboriculture. Champaign, IL	2013	First Edition	1-198
Vegetation Management Guideline for Maximum Conductor Sag and Blowout. American Electric Power	2013	TVMD-011	
Work Quality Assurance and Quality Control Inspections. American Electric Power	2013	TVMD-013	

[i] *American National Standard for Tree Care Operations – Tree, Shrub and Other Woody Plant Maintenance – Standard Practices (Integrated vegetation Management a. Electric Utility Rights-of-way (Part 7 - 2006),* Tree Care Industry Association, Manchester, NH
[ii] *Best Management Practices – Utility Pruning of Trees.* International Society of Arboriculture. Champaign, IL
[iii] *American National Standard for Tree Care Operations – Tree, Shrub and Other Woody Plant Maintenance – Standard Practices (Integrated vegetation Management a. Electric Utility Rights-of-way (Part 7 - 2006),* Tree Care Industry Association, Manchester, NH
[iv] *Supplementary Terms and Conditions for Forestry Contracts.* American Electric Power
[v] *AEP General Terms and Conditions for Labor and Services.* American Electric Power
[vi] *AEP General Terms and Conditions for Labor and Services.* American Electric Power
[vii] *AEP General Terms and Conditions for Labor and Services.* American Electric Power
[viii] *Supplementary Terms and Conditions for Forestry Contracts.* American Electric Power
[ix] *Supplementary Terms and Conditions for Forestry Contracts.* American Electric Power
[x] *Supplementary Terms and Conditions for Forestry Contracts.* American Electric Power
[xi] *Supplementary Terms and Conditions for Forestry Contracts.* American Electric Power
[xii] *Supplementary Terms and Conditions for Forestry Contracts.* American Electric Power
[xiii] *AEP General Terms and Conditions for Labor and Services.* American Electric Power
[xiv] *AEP Vegetation Management Ground Spray Requirements.* American Electric Power
[xv] *AEP Vegetation Management Ground Spray Requirements.* American Electric Power
[xvi] *AEP Vegetation Management Ground Spray Requirements.* American Electric Power
[xvii] *Managing Hazard Trees on FAC-003 Applicable Circuits.* American Electric Power
[xviii] *American National Standard for Arboricultural Operations – Safety Requirements.* International Society of Arboriculture. Champaign, IL
[xix] *American National Standard for Arboricultural Operations – Safety Requirements.* International Society of Arboriculture. Champaign, IL
[xx] *American National Standard for Arboricultural Operations – Safety Requirements.* International Society of Arboriculture. Champaign, IL
[xxi] *American National Standard for Arboricultural Operations – Safety Requirements.* International Society of Arboriculture. Champaign, IL

The following list gives a detailed description for each of the programs under Kingsport's Targeted Reliability Plan:

Vegetation Management Program: The objective of this program is to improve SAIDI and SAIFI indices as they relate to tree-related outages. The Company is proposing to transition from its current performance-based vegetation management approach to a cycle-based program to address a major source of interruptions on its distribution system, vegetation both inside and outside of the Rights-of-Way (ROW). The cycle-based program will proactively manage vegetation, thereby reducing tree-caused momentary interruptions and/or sustained outages to Kingsport customers. By managing vegetation underneath the power lines coupled with the removal of yard, danger and edge trees, storm recovery efforts will be enhanced with easier access for restoration workers along with decreasing the chances for larger trees to fall into the power lines.

Vegetation Management	PROPOSED Spending Plan	
	Capital	O&M
Year 1	$1,760,063	$3,687,750
Year 2	$1,795,264	$3,761,505
Year 3	$1,831,169	$3,836,735
Year 4	$1,867,792	$3,913,470
Year 5	$838,125	$2,514,375
Total Spend	**$8,092,413**	**$17,713,835**

Note: Amounts shown are projected new capital, and total O&M expense, for each year.

Circuit Inspections and Maintenance Program: The objective of this program is to visually inspect overhead facilities to identify and correct potential problems before they cause service interruptions. The following activities are planned under this program: Circuit Inspections, Pole Replacements, Underground Program, Recloser Replacements, Overhead Small Wire Replacements, Underground Small Wire Replacements, and Cutout and Lightening Arrester Replacements. Through these inspections, KgPCo can identify, repair or replace such things as broken insulators and blown lightning arresters. As a result of identifying, repairing and replacing problem assets before they cause an outage, the Company is able to maintain system safety and reliability resulting in KgPCo customers experiencing fewer and shorter service interruptions. By performing these circuit inspections along with associated repairs, the poles in service will be made stronger over time to better withstand storms (*e.g.*, larger poles that are better able to withstand stronger winds). In addition, other line equipment such as wire, splices, connectors, etc. will be periodically inspected and replaced to better withstand storms.

Circuit Inspections & Maintenance	PROPOSED Spending Plan	
	Capital	O&M
Year 1	$734,294	$234,780
Year 2	$740,331	$234,911
Year 3	$742,889	$235,002
Year 4	$745,810	$235,099
Year 5	$1,575,500	$366,000
Total Spend	**$4,538,824**	**$1,305,793**

Note: Amounts shown are projected new capital, and total O&M expense, for each year.

Circuit Improvements Program: The objective of this program is to perform various enhancements to individual circuits, as detailed in the individual items below, to primarily improve their reliability performance with secondary benefits including system hardening (as applicable with replaced poles) and storm recovery.

The following activities are planned under the Circuit Improvements Program:

a) Targeted Reliability - improve service provided to customers through projects such as multi-phasing, reconductoring, voltage conversions, relocations to more accessible locations, and constructing tie-lines to aid in contingency recovery efforts. Any poles replaced in conjunction with this category will be undertaken with the new storm hardening guidelines in mind.

b) Sectionalizing - improve the reliability of distribution circuits by adding new, modifying existing or replacing sectionalizing devices. This enhanced sectionalizing enables smaller circuit segments and fewer customers to be interrupted due to faults that may occur on distribution circuits. This activity also has the net result of affecting less customers per outage during storm events.

c) Back Lot Construction - improve the reliability of distribution circuits by selectively relocating critical line segments along roads or burying the lines underground along existing overhead paths. This initiative will be undertaken in conjunction with the Vegetation Management Program in extremely difficult ROW conditions where it is more advantageous for both the affected customers and the Company to bury the power line (i.e., make the transition from overhead to underground facilities).

d) Downtown Modernization – improve the reliability of distribution circuits by replacing primary spacer cables along with secondary cables, poles and transformer banks. Plans to also reconductor an overhead line and construct an associated tie-line to eliminate a main line underground going through an existing downtown building. This plan will be completed in conjunction with Kingsport officials and their associated efforts to renovate the downtown area including the rework on the downtown electrical facilities.

e) Distribution Automation Circuit Reconfiguration – improve the reliability of distribution circuits through the addition of automated loop feed switching including Supervisory Control and Data Acquisition (SCADA) between two or more distribution feeders in a protection scheme. Switching schemes can be designed to automate the switching between circuit zones that are served from two or more distribution sources. These zones are all part of a traditional radially fed distribution design, normally served by a single source at a substation. However, zones in the scheme that experience an extended fault can be automatically isolated while customers in all other zones remain in service by transferring them to the alternate source. By providing the affected customers with both a normal and an alternate energy source, the extent of storm outages can be reduced.

Circuit Improvements	PROPOSED Spending Plan	
	Capital	O&M
Year 1	$483,562	$4,691
Year 2	$503,561	$4,784
Year 3	$512,769	$4,879
Year 4	$523,180	$4,976
Year 5	$2,089,132	$284,137
Total Spend	**$4,112,204**	**$303,468**

Note: Amounts shown are projected new capital, and total O&M expense, for each year.

Station Improvements Program: The objective of this program is to rebuild selected stations to current and more reliable standards while also installing SCADA systems in sub-stations which do not have this capability.

The following activities are planned under the Station Improvements Program:

a) Station Equipment - improve the reliability of distribution circuits through station rebuilds and reconfigurations to eliminate 12kV distribution "islands" and 34.5kV distribution grounding issues. The rebuilds will include new station structures as applicable to better withstand storms. The elimination of distribution "islands" which currently have incompatible voltages will optimize the ability to perform load switching during future storm recovery efforts. Finally, the elimination of the distribution grounding issues will enhance the relay protection and control schemes on the sub-transmission system. Thus, better fault detection and isolation of the affected portions of the system will be achieved during storms.

b) Distribution SCADA - improve the reliability of distribution circuits by installing SCADA at all of the remaining stations and sub-stations that do not currently have SCADA capability. With 100% penetration of SCADA achieved over time, distribution dispatch personnel will know remotely the status of each sub-station during times of storm recovery. In addition, the same dispatch personnel will have the ability to remotely operate some of the equipment working in conjunction with local restoration workers. This remote operation of some of the sub-station equipment will have the net effect of shortening restoration times during a storm.

Station Improvements	PROPOSED Spending Plan	
	Capital	O&M
Year 1	$0	$0
Year 2	$0	$0
Year 3	$0	$0
Year 4	$0	$0
Year 5	$2,573,500	$59,100
Total Spend	**$2,573,500**	**$59,100**

Note: Amounts shown are projected new capital, and total O&M expense for each year.