



## Appendix B

### **WPC Analysis and Remedial Action Report**

**Circuit Number** – 638052

**Division** – Boone Trails

**Area Served** – Warrenton, Missouri

**SAIFI Value** – 136.00

#### **Analysis Results:**

The majority of the customers associated with this circuit were moved to the new Legion Trails substation, which was energized on December 17, 2009. The customer count on this circuit was 712 when the outages recorded on this circuit occurred. At the end of 2009 only 1 customer remained on this circuit. If the original customer count were to be included, the overall SAIFI calculation for this circuit would have been 0.19. As a result, the overall SAIFI count for this circuit was artificially inflated.

#### **Corrective Actions:**

No additional corrective action is planned for this circuit.



## Appendix B

### **WPC Analysis and Remedial Action Report**

**Circuit Number** – 811057

**Division** – SEMO

**Area Served** – Cape Girardeau, Missouri

**SAIFI Value** – 28.89

#### **Analysis Results:**

This circuit experienced customer interruptions in 2009 due to overhead malfunctions. In July, 2009 twenty miles of this circuit was transferred to the new Gordonville substation. This resulted in a reduction in the number of customers on this circuit which inflated the SAIFI value.

#### **Corrective Actions:**

Tree trimming maintenance will be done on this circuit in 2010.

A special overhead visual inspection will be performed on this circuit in 2010. This inspection will focus on animal guarding, tap fusing, and maintenance issues and any deficiencies identified will be addressed.

An overhead infrared inspection will be performed on this circuit in 2010. The repair work identified as a result of the inspection will be completed in accordance with AmerenUE's infrastructure inspection policy.



## Appendix B

### **WPC Analysis and Remedial Action Report**

**Circuit Number** – 607054

**Division** – SEMO

**Area Served** – Benton, Missouri

**SAIFI Value** – 9.53

#### **Analysis Results:**

Customer interruptions experienced on this circuit in 2009 included: substation breaker problems; animal intrusions; tree-caused outages; and overhead malfunctions.

#### **Corrective Actions:**

Tree trimming is scheduled for this circuit in 2010.

DOJM Work Request number 2TSE086476 was created in order to install reclosers and spacers to this circuit to prevent substation breaker outages. This work request was completed in August, 2009.

A special overhead visual inspection will be performed on this circuit in 2010. This inspection will focus on animal guarding, tap fusing, and maintenance issues and any deficiencies identified will be addressed.

An overhead infrared inspection will be performed on this circuit in 2009. The repair work identified as a result of the inspection will be completed in accordance with AmerenUE's infrastructure inspection policy.



## Appendix B

### **WPC Analysis and Remedial Action Report**

**Circuit Number** – 465055

**Division** – SEMO

**Area Served** – Steele, Missouri

**SAIFI Value** – 7.05

#### **Analysis Results:**

This circuit experienced customer interruptions in 2009 due to overhead malfunctions, primarily from primary wire and fuse failures.

#### **Corrective Actions:**

A mid-cycle tree trimming patrol was performed on this circuit in 2010.

An 8.6 miles reconductoring project was completed on this circuit in December, 2009.

Tap fuses were added to unfused taps on this circuit in 2009.

A special overhead visual inspection will be performed on this circuit in 2010. This inspection will focus on animal guarding, tap fusing, and maintenance issues and any deficiencies identified will be addressed.

An overhead infrared inspection will be performed on this circuit in 2010. The repair work identified as a result of the inspection will be completed in accordance with AmerenUE's infrastructure inspection policy.



## Appendix B

### **WPC Analysis and Remedial Action Report**

**Circuit Number** – 464052

**Division** – SEMO

**Area Served** – Portageville, Missouri

**SAIFI Value** – 6.27

#### **Analysis Results:**

Customer interruptions experienced on this circuit in 2009 included: tree-caused outages; overhead malfunctions; and loss of transmission to the circuit.

#### **Corrective Actions:**

This circuit had six special tree trims performed on the three-phase backbone as well as a special tree trimming performed on a single-phase tap in 2010. These special tree trims were performed in order to eliminate the outages due to tree failures.

A special overhead visual inspection will be performed on this circuit in 2010. This inspection will focus on animal guarding, tap fusing, and maintenance issues and any deficiencies identified will be addressed.

A project will be created to add tap fuses and reassess the fuse coordination associated with this circuit.

An overhead infrared inspection will also be performed of this circuit in 2010. The repair work identified as a result of the inspection will be completed in accordance with AmerenUE's infrastructure inspection policy.



## Appendix B

### WPC Analysis and Remedial Action Report

**Circuit Number** – 638055

**Division** – Boone Trails

**Area Served** – Warrenton, Missouri

**SAIFI Value** – 6.14

#### **Analysis Results:**

The majority of the customers associated with this circuit were moved to the new Legion Trails, which was energized on December 17, 2009. The customer count on this circuit was 835 when the outages recorded on this circuit occurred. At the end of 2009 only 28 customers remained on this circuit. If the original customer count were to be included, the overall SAIFI calculation for this circuit would have been 0.21. As a result, the overall SAIFI count for this circuit was artificially inflated.

#### **Corrective Actions:**

No additional corrective action is planned for this circuit.



## Appendix B

### **WPC Analysis and Remedial Action Report**

**Circuit Number** – 627051

**Division** – Boone Trails

**Area Served** – St. Peters, Missouri

**SAIFI Value** – 6.02

#### **Analysis Results:**

Customer interruptions experienced on this circuit in 2009 included: a lightning strike which burned a phase line during a storm; and a large tree limb which fell on the circuit as result of high winds.

#### **Corrective Actions:**

Following the outage due to the tree failure, forestry personnel removed the damaged limb and performed spot trimming in the area.

During the construction of the new Salt Lick substation, a large portion of this circuit was rebuilt and most of the rebuilt line section was diverted to the new Salt Lick substation. Since the Salt Lick substation was placed in operation, there have been no outages on this circuit.



## Appendix B

### **WPC Analysis and Remedial Action Report**

**Circuit Number** – 729052

**Division** – Boone Trails

**Area Served** – St. Peters, Missouri

**SAIFI Value** – 5.67

#### **Analysis Results:**

Customer interruptions experienced on this circuit in 2009 included: a broken cross arm that failed while pulling wire during construction of the new 729058 circuit.

#### **Corrective Actions:**

After switching to isolate the section of line, the crews replaced the cross arm and finished the construction of the new circuit 729058.

Following the construction of a new Salt Lick substation, a large portion of this circuit was diverted to the new Salt Lick substation and became portions of the new 689052 and 689053 circuits. Other than a large limb falling from outside the easement during a storm on circuit 689053, there have been no outages on circuits 729052, 689052 or 689053 since the Salt Lick substation was put into service.



## Appendix B

### **WPC Analysis and Remedial Action Report**

**Circuit Number** – 454055

**Division** – SEMO

**Area Served** – Caruthersville, Missouri

**SAIFI Value** – 5.55

#### **Analysis Results:**

Customer interruptions experienced on this circuit in 2009 included: overhead equipment malfunctions; and tree-caused outages.

#### **Corrective Actions:**

Tree trimming is scheduled for this circuit in 2010.

Ten miles of the 34kV circuit and associated under-build will be reconductored and a new 34kV loop constructed on this circuit.

Overhead visual and infrared inspections will be performed on this circuit in 2010. The repair work identified as a result of the inspection will be completed in accordance with AmerenUE's infrastructure inspection policy.



## Appendix B

### **WPC Analysis and Remedial Action Report**

**Circuit Number** – 655053

**Division** – Boone Trails

**Area Served** – St. Peters, Missouri

**SAIFI Value** – 4.78

#### **Analysis Results:**

Customer interruptions experienced on this circuit in 2009 included: animal intrusions, specifically in the area behind a large substation on this circuit where beavers have built dams. Some of the felled trees have fallen onto the circuit from areas outside of the easement.

#### **Corrective Actions:**

The division has added fuses and a recloser to limit the number of customers interruptions experienced on this circuit, but due to the limited success of the local city in trapping and removing the beavers, the division has also converted a portion of the line of the subdivision to underground construction. The division is also reconfiguring the overhead lines to protect impacted commercial customers and further reduce the number of residential customers affected by this problem. These efforts are expected to eliminate most, if not all, of the outages caused by the beavers. However, given the ambitious nature of the beavers, additional overhead to underground conversion work may be needed.



## Appendix B

### **WPC Analysis and Remedial Action Report**

**Circuit Number** – 622054

**Division** – SEMO

**Area Served** – Charleston, Missouri

**SAIFI Value** – 4.71

#### **Analysis Results:**

This circuit experienced customer interruptions in 2009 due to overhead equipment malfunctions and substation failures.

#### **Corrective Actions:**

A project will be created to address unfused taps and verify fuse coordination on this circuit to minimize future outages.

A special overhead visual inspection will be performed on this circuit in 2010. This inspection will focus on animal guarding, tap fusing, and maintenance issues and any deficiencies identified will be addressed.

An infrared inspection of this circuit will also be performed in 2010. The repair work identified as a result of the inspection will be completed in accordance with AmerenUE's infrastructure inspection policy.



## Appendix B

### WPC Analysis and Remedial Action Report

**Circuit Number** – 795051

**Division** – Boone Trails

**Area Served** – New London, Missouri

**SAIFI Value** – 4.71

#### **Analysis Results:**

This circuit experienced customer interruptions in 2009 due to tree failures, animal intrusions, overhead failures, and substation failure.

#### **Corrective Actions:**

Tree trimming is scheduled for portions of this circuit in 2010.

An “Interruption” distribution automation device was installed at the midpoint of this radial circuit in September, 2009.

The 34kV subtransmission line which serves the Saverton area is being rebuilt over a three year period which began in 2009. In addition, 17,000 feet of the distribution circuit is being recondored and the poles will be replaced in 2010. This work will eliminate many of the #4 and #6 copperweld wire splices in the circuit thought to be contributing factors to overhead failures.



## Appendix B

### **WPC Analysis and Remedial Action Report**

**Circuit Number** – 457052

**Division** – SEMO

**Area Served** – Clarkton, Missouri

**SAIFI Value** – 4.66

#### **Analysis Results:**

This circuit experienced customer interruptions in 2009 due to overhead malfunctions, public vehicles accidents, lighting caused failures, a tree-caused outage, and loss of supply to the circuit.

#### **Corrective Actions:**

Tree trimming is scheduled for this circuit in 2010.

As a result of the 2009 ice storm in SEMO, the Jim Hill 34kV line was rebuilt with new wire and poles.

A project will be created to add fuses to the unfused taps in the Clarkton area of the circuit to minimize future outages.

A special overhead visual inspection will be performed on this circuit in 2010. This inspection will focus on animal guarding, tap fusing, and maintenance issues and any deficiencies identified will be addressed.

An infrared inspection of this circuit will also be performed in 2010. The repair work identified as a result of the inspection will be completed in accordance with AmerenUE's infrastructure inspection policy.



## Appendix B

### WPC Analysis and Remedial Action Report

**Circuit Number** – 109001

**Division** – Archview

**Area Served** – Saint Louis City, Missouri

**SAIFI Value** – 4.63

#### **Analysis Results:**

Customer interruptions experienced on this circuit in 2009 included: a circuit outage as a result of an underground cable failure on 34kV subtransmission CNTL-74; and an animal-related fault on a customer substation transformer (resulting only in a momentary).

#### **Corrective Actions:**

Animal guards were installed on both customer substation transformers which impacted this circuit in October, 2009.

The 34kV subtransmission circuit CNTL-74 will be reviewed by division engineering personnel to determine the cause of the momentary and cable failures.

The circuit overhead equipment was visually inspected by division engineering and estimating personnel. The following DOJM work requests numbers were generated as a result of these inspections:

DOJM Work Request number 21MT501508 was created in order to repair floating primary pins. This work request is scheduled to be completed in 2010.

DOJM Work Request number 21MT501510 was created in order to repair missing a V-brace. This work request is scheduled to be completed in 2010.

DOJM Work Request number 21MT501517 was created in order to repair hanging conduit. This work request is scheduled to be completed in 2010.

DOJM Work Request number 21MT501521, which will replace porcelain fusible switches with 15kV open cut-out switches, is scheduled to be completed in 2010.

DOJM Work Request number 21MT501557, created to straighten a leaning pole, is scheduled to be completed in 2010.

An overhead visual and infrared inspection will be performed on this circuit in 2010. Any repair work identified as a result of this inspection will be addressed.



## Appendix B

Division engineering personnel will perform DEW power flow analysis on this circuit, including both normal and contingency conditions, to ensure that the circuit has component rating overloads and to ensure that system voltages are within prescribed limits.



## Appendix B

### **WPC Analysis and Remedial Action Report**

**Circuit Number** – 475052

**Division** – SEMO

**Area Served** – Graniteville, Missouri

**SAIFI Value** – 4.55

#### **Analysis Results:**

This circuit experienced customer interruptions in 2009 due to overhead equipment malfunctions, a substation malfunction, and a loss of transmission supply, tree-caused outages, and animal intrusions.

#### **Corrective Actions:**

Three tap fusing projects performed under DOJM Work Request numbers 28IR033579, 28IR033580, and 28IR033581. The work requests will be completed in 2010.

Six miles of this circuit will be reconductored in 2010.

Overhead visual and infrared inspections will be performed on this circuit in 2010. The repair work identified as a result of the inspection will be completed in accordance with AmerenUE's infrastructure inspection policy.



## Appendix B

### **WPC Analysis and Remedial Action Report**

**Circuit Number** – 256056

**Division** – Gateway

**Area Served** – Maryland Heights, Missouri Area

**SAIFI Value** – 4.52

#### **Analysis Results:**

Customer interruptions experienced on this circuit in 2009 included: two (2) direct buried cable faults; an overhead equipment malfunction; a broken tree limb during windy conditions.

#### **Corrective Actions:**

Tree trimming will be performed on this circuit in 2010.

DOJM work request numbers 21MT484402 and 21MT259595 were created in order to replace the failed direct buried cable. These jobs were completed in August and December, 2009.

DOJM work request number 21MT469564, created to install a fuse switch on the circuit, was completed in February, 2009.

A Capacitor Inspection was performed on this circuit in 2009. Four deficiencies were identified and will be addressed.

An overhead infrared inspection is scheduled to be performed on this circuit in 2010. The repair work identified as a result of the inspection will be completed in accordance with AmerenUE's infrastructure inspection policy.



## Appendix B

### **WPC Analysis and Remedial Action Report**

**Circuit Number** – 475051

**Division** – SEMO

**Area Served** – Graniteville, Missouri

**SAIFI Value** – 4.44

#### **Analysis Results:**

This Customer interruptions experienced on this circuit in 2009 included: overhead malfunctions; tree-caused outages; loss of transmission; and animal intrusions.

#### **Corrective Actions:**

A tree trimming mid-cycle patrol is scheduled for this circuit in 2010.

Two tap fusing and animal guarding projects performed under DOJM Work Request numbers 28IR031621 and 28IR033263. These work requests were completed in April and December, 2009.

A total of 13.5 miles of this circuit will be recondored in 2010 under DOJM Work Request numbers 28IR033349, 28IR033350, and 28IR033351.

Overhead visual and infrared inspections will be performed on this circuit in 2010. The repair work identified as a result of the inspection will be completed in accordance with AmerenUE's infrastructure inspection policy.



## Appendix B

### WPC Analysis and Remedial Action Report

**Circuit Number** – 279052

**Division** – RiverBluffs

**Area Served** – Booneville, Missouri

**SAIFI Value** – 4.39

#### **Analysis Results:**

This circuit is 35% rear lot construction through an established neighborhood and an assisted living development with mature trees and limited truck access. The remaining section of the circuit runs along streets with truck access. Approximately 500 feet of the circuit consists of underground construction through the established neighborhood. Customer interruptions experienced on this circuit in 2009 included: two (2) squirrel intrusions into 600 amp switches; tree problems during a storm; and a substation equipment failure.

#### **Corrective Actions:**

Tree trimming on this circuit was completed in 2007. In addition, a mid-cycle patrol was completed in 2009.

This circuit had an underground visual inspection and an overhead ground line inspection completed on it in 2009. The repair work identified as a result of these inspections will be completed in 2010.

The Division Engineering Department will perform a field inspection of this circuit for possible additional squirrel protection, tree trimming, and other reliability improvements in 2010. Work requests will be created to address any reliability improvements identified as a result of this field inspection.

The division is working with the developer of the assisted living facility to convert a portion of the circuit from overhead construction to underground construction. The division plans to continue converting the remaining three spans of overhead construction in the rear lot section of the circuit to underground construction once the developer has completed its portion of the work.



## Appendix B

### **WPC Analysis and Remedial Action Report**

**Circuit Number** – 939052

**Division** – Missouri Valley

**Area Served** – Huntsville, Missouri

**SAIFI Value** – 4.16

#### **Analysis Results:**

Customer interruptions experienced on this circuit in 2009 included: substation equipment failures; circuit structure failures; and tree contacts.

#### **Corrective Actions:**

An overhead visual and infrared inspection is scheduled for this circuit in 2010. During these inspections the circuit will be inspected for deficiencies such as defective poles, insulator deterioration, loose or missing line hardware, or other structural problems. The repair work identified as a result of the inspection will be completed in accordance with AmerenUE's infrastructure inspection policy.



## Appendix B

### WPC Analysis & Remedial Action Report

**Circuit Number** – 281051

**Division** – Gateway

**Area Served** – Hazelwood, Missouri Area

**SAIFI Value** – 4.01

#### **Analysis Results:**

Customer interruptions experienced on this circuit in 2009 included: lightning; unknown causes; three (3) large device-related outages caused by tree conditions; and two (2) outages caused by equipment problems.

#### **Corrective Actions:**

An overhead visual inspection is in progress of this circuit. The repairs identified so far have included the replacement of overhead and down guys, neutral wire, broken v-braces, lightning arrestors, insulators, primary wire, grounds, risers, crossarms, pins, and poles. These repairs will be completed on DOJM Work Request numbers 21MT490540, 21MT490539, 21MT490538, 21MT490536, 21MT490535, and 21MT490534. This work will be completed in 2010.

DOJM Work Request number 21MT486453 was created to replace a pole, to replace a fuse, and to remove a portion of single-phase wire in order to reduce outage exposure. These jobs are in progress and are expected to be completed in 2010.

DOJM Work Request number 21MT501616 was created to install fuses in order to protect the circuit's backbone, is scheduled to be completed in 2010.

An overhead infrared inspection is scheduled to be performed on this circuit in 2010. The repair work identified as a result of the inspection will be completed in accordance with AmerenUE's infrastructure inspection policy.

Division engineering personnel field checked this circuit in early 2010.



## Appendix B

### **WPC Analysis and Remedial Action Report**

**Circuit Number** – 922065

**Division** – Central Ozarks

**Area Served** – Jefferson City, Missouri

**SAIFI Value** – 4.00

#### **Analysis Results:**

This 14.4kV circuit serves two customers; a metered school football practice field and an unmetered school zone flashing light. This circuit experienced two outages in 2009 for a total of 4 CI. The customer count used to calculate SAIFI is based on metered customers resulting in a SAIFI calculation of 4.00.

#### **Corrective Actions:**

Tree trimming was completed on this circuit in 2008.

Due to the actual low incidence of outages on this circuit, no additional work is planned for this circuit in 2010.



## Appendix B

### **WPC Analysis and Remedial Action Report**

**Circuit Number** – 690057

**Division** – SEMO

**Area Served** – Dexter, Missouri

**SAIFI Value** – 3.92

#### **Analysis Results:**

Customer interruptions experienced on this circuit in 2009 included: overhead equipment malfunctions; public-vehicle-caused outages; and lightning.

#### **Corrective Actions:**

A project will be created to add fuses to the unfused taps on this circuit.

The public vehicle accident locations on this circuit will be reviewed for possible relocation.

A special overhead visual inspection will be performed on this circuit in 2010. This inspection will focus on animal guarding, tap fusing, and maintenance issues and any deficiencies identified will be addressed.

An overhead infrared inspection of this circuit will be performed in 2010. The repair work identified as a result of the inspection will be completed in accordance with AmerenUE's infrastructure inspection policy.



## Appendix B

### **WPC Analysis and Remedial Action Report**

**Circuit Number** – 167053

**Division** – Gateway

**Area Served** – Bellefontaine Neighbors, Missouri Area

**SAIFI Value** – 3.81

#### **Analysis Results:**

This circuit runs from the Larimore Substation south through a large area of private property and a heavy wooded area. Customer interruptions experienced on this circuit in 2009 included: trees problems; underground equipment failure; broken primary wire; two (2) fuse failures; two (2) tree contacts; and a recloser opening.

#### **Corrective Actions:**

Extensive hot-spot tree trimming was performed on this circuit in 2008. This circuit was aggressively tree trimmed in 2009. In fact, this trimming was the most aggressive performed in this area. Until the most troublesome areas of this circuit are converted to underground construction, more frequent and aggressive tree trimming must be performed to maintain the reliability of this circuit.

DOJM Work Request number 21MT470137, created to relocate a fuse in order to protect the circuit's backbone, was completed in April, 2009.

DOJM Work Request number 21MT473359, created to install some missing animal guards, was completed in March, 2009.

DOJM Work Request numbers 21MT500676, 21MT500682, and 21MT500683 were created to install fuses and fix wire problems on the circuit. These Work Requests will be completed in 2010.

An infrared inspection was performed on this circuit in 2009.

DOJM Work Request number 21MT501636 was created to install an Interruption distribution automation switch at the midpoint of this circuit. This project is in the design stage but is expected to be completed in 2010.

An overhead infrared inspection is scheduled to be performed on this circuit in 2010. The repair work identified as a result of the inspection will be completed in accordance with AmerenUE's infrastructure inspection policy.

Division engineering personnel field checked this circuit in early 2010.



Appendix B  
**WPC Analysis and Remedial Action Report**

**Circuit Number** – 675051

**Division** – Boone Trails

**Area Served** – Old Monroe, Missouri

**SAIFI Value** – 3.80

**Analysis Results:**

A number of customers associated with this circuit were moved to a new substation which was built in 2009 and this circuit was divided into three circuits. The customer count on this circuit was 283 when the outages on this circuit occurred. At the end of 2009 only 60 customers remained on this circuit. If the original customer counts were included, the overall SAIFI calculation for this circuit would have been 0.81. As a result the overall SAIFI count for this circuit was artificially inflated.

**Corrective Actions:**

No additional corrective action has been planned for this circuit.



## Appendix B

### **WPC Analysis and Remedial Action Report**

**Circuit Number** – 268003

**Division** – Archview

**Area Served** – University City and Pagedale, Missouri

**SAIFI Value** – 3.56

#### **Analysis Results:**

Customer interruptions experienced on this circuit in 2009 included: two (2) tree-caused outages; and unknown cause (but it is suspected to be a broken switch and crossarm on private property).

#### **Corrective Actions:**

Tree trimming will be performed on this circuit in 2010.

DOJM Work Request number 21MT498829 was created to replace a switch with fuses to reduce tree exposure to the circuit's backbone.

Overhead visual and infrared inspections will be performed on this circuit in 2010. The repair work identified as a result of the inspection will be completed in accordance with AmerenUE's infrastructure inspection policy.



## Appendix B

### **WPC Analysis and Remedial Action Report**

**Circuit Number** – 455053

**Division** – SEMO

**Area Served** – Caruthersville, Missouri

**SAIFI Value** – 3.56

#### **Analysis Results:**

Customer interruptions experienced on this circuit in 2009 included: overhead equipment malfunctions; public vehicle accidents; a substation malfunction; and outages resulting from the impact of February 2009 ice storm.

#### **Corrective Actions:**

Ten miles of the 34kV and associated under-build will be reconductored and a new 34kV loop will be constructed on this circuit.

A special overhead visual inspection will be performed on this circuit in 2010. This inspection will focus on animal guarding, tap fusing, and maintenance issues and any deficiencies identified will be addressed.

An overhead infrared inspection of this circuit will also be performed in 2010. The repair work identified as a result of the inspection will be completed in accordance with AmerenUE's infrastructure inspection policy.



## Appendix B

### WPC Analysis & Remedial Action Report

**Circuit Number** – 256057

**Division** – Gateway

**Area Served** – Maryland Heights, Missouri Area

**SAIFI Value** – 3.54

#### **Analysis Results:**

Customer interruptions experienced on this circuit in 2009 included: a public caused outage due to excavation; a public vehicle accident; and an underground malfunction.

#### **Corrective Actions:**

Tree trimming will be performed on this circuit in 2010.

DOJM Work Request numbers 21MT470274 and 21MT495770 were created in order to install fused switches on the circuit these work requests were completed in January 2009.

DOJM Work Request number 21MT499358 was created in order to replace a broken pole top pin on the circuit, was completed in March, 2010.

Division engineering personnel performed a field patrol of this circuit in 2010.

A Capacitor Inspection was performed on this circuit in 2009. Four deficiencies were identified and will be addressed.

An overhead infrared inspection is scheduled to be performed on this circuit in 2010. The repair work identified as a result of the inspection will be completed in accordance with AmerenUE's infrastructure inspection policy.



## Appendix B

### WPC Analysis and Remedial Action Report

**Circuit Number** – 484054

**Division** – SEMO

**Area Served** – Potosi, Missouri

**SAIFI Value** – 3.54

#### **Analysis Results:**

Customer interruptions experienced on this circuit in 2009 included: overhead equipment malfunctions; public vehicle accidents; animal intrusions; and tree-caused outages.

#### **Corrective Actions:**

Six miles of this circuit was recondored under DOJM Work Request number 28IR031900. This work request was completed in September, 2009.

Animal guards were added to this circuit under DOJM Work Request number 28IR031772. This work request was completed in March, 2009.

Fuses and a recloser were added to this circuit under DOJM Work Request number 28IR031885. This work request was completed in March, 2009.

A recloser will be added to this circuit to minimize future outages under DOJM Work Request number 28IR033556, which is expected to be completed in 2010.

Fuses will be added to unfused taps on this circuit under DOJM Work Request number 28IR033583, which is expected to be completed in 2010

A special overhead visual inspection will be performed on this circuit in 2010. This inspection will focus on animal guarding, tap fusing, and maintenance issues and any deficiencies identified will be addressed.

An infrared inspection will be performed on this circuit in 2010. The repair work identified as a result of the inspection will be completed in accordance with AmerenUE's infrastructure inspection policy.



## Appendix B

### **WPC Analysis and Remedial Action Report**

**Circuit Number** – 147057

**Division** – Gateway

**Area Served** – Maryland Heights, Missouri Area

**SAIFI Value** – 3.53

#### **Analysis Results:**

Customer interruptions experienced on this circuit in 2009 included: an overhead malfunction; and two underground malfunctions.

#### **Corrective Actions:**

Tree trimming was last performed on this circuit in 2007.

PowerOn project number 25-7-1940-1473, completed in January, 2009, replaced a circuit lateral with underground cable.

Overhead circuit and streetlight inspections were performed on this circuit in 2009 and twenty deficiencies were identified as a result of these inspections. Of these twenty deficiencies, twelve have been addressed.

A Capacitor Inspection was performed on this circuit in 2009. Four deficiencies were identified and will be addressed.

An overhead ground line and infrared inspections will be performed on this circuit in 2010. Any repair work identified as a result of these inspections will be addressed.



## Appendix B

### **WPC Analysis and Remedial Action Report**

**Circuit Number** – 298005

**Division** – Archview

**Area Served** – St Louis, City, Missouri

**SAIFI** – 3.50

#### **Analysis Results:**

This circuit was identified as a worst performing circuit in 2009, with a SAIFI of 3.50. This circuit normally serves four customers and prior to 2009 the circuit had had a good reliability history. However, due to abnormal switching, this circuit was tied to circuit number 298008 which included additional customers. During this temporary switching arrangement in March, 2009, a building fire occurred which caused 14 customer interruptions, 13 of which were experienced by customers associated with circuit number 298008. The inclusion of these additional customers inflated the SAIFI calculation for this circuit, making it a worst performing circuit.

#### **Corrective Actions:**

No corrective actions are anticipated at this time.



## Appendix B

### **WPC Analysis and Remedial Action Report**

**Circuit Number** – 459051

**Division** – SEMO

**Area Served** – Hayti, Missouri

**SAIFI Value** – 3.45

#### **Analysis Results:**

Customer interruptions experienced on this circuit in 2009 included: tree-caused outages; and overhead equipment malfunctions. (Note: Of the 48 outages experienced on this circuit, 23 occurred during the February, 2009 SEMO ice storm.)

#### **Corrective Actions:**

A tree trimming mid-cycle patrol will be performed on this circuit in 2010.

Overhead visual and infrared inspections will be performed on this circuit in 2010. The repair work identified as a result of the inspection will be completed in accordance with AmerenUE's infrastructure inspection policy.



## Appendix B

### **WPC Analysis and Remedial Action Report**

**Circuit Number** – 485052

**Division** – SEMO

**Area Served** – Richwoods, Missouri

**SAIFI Value** – 3.39

#### **Analysis Results:**

Customer interruptions experienced on this circuit in 2009 included: equipment failure during storms.

#### **Corrective Actions:**

A recloser was added to this circuit to help minimize future outages under DOJM Work Request number 28IR033024. This work request was completed in September, 2009.

A recloser and animal guards were installed on this circuit under DOJM Work Request number 28IR032627. This work request was completed in July, 2009.

Tap fuses will be added to this circuit under DOJM Work Request number 28IR033584, which is expected to be completed in October, 2010.

Overhead visual and infrared inspections will be performed on this circuit in 2010. The repair work identified as a result of the inspection will be completed in accordance with AmerenUE's infrastructure inspection policy.



## Appendix B

### **WPC Analysis and Remedial Action Report**

**Circuit Number** – 172003

**Division** – Gateway

**Area Served** – University City, Missouri Area

**SAIFI Value** – 3.37

#### **Analysis Results:**

Customer interruptions experienced on this circuit in 2009 included: two (2) extended outages due to tree problems; two (2) extended outages due to a broken wire during high temperature conditions; and five (5) large extended device outages all related to the same tree problem occurring on the same day.

#### **Corrective Actions:**

Tree trimming was completed on this circuit in 2009. There were 633 trees trimmed along the total three miles of overhead circuitry. Arrangements were made with customers for the removal of another 63 trees inside and outside of the easements and right-of-way along this circuit. Only 25% of the trimming necessary on this circuit is accessible by bucket truck.

This circuit underwent an infrared inspection in 2009.

Tree trimmers and division estimating personnel identified a number of maintenance problems on the circuit. DOJM Work Request numbers 21MT482235 and 21MT481640 were created, in order to address the various problems on this circuit. These work requests were completed in December, 2009 and January, 2010.

An overhead infrared inspection is scheduled for this circuit in 2010. The repair work identified as a result of the inspection will be completed in accordance with AmerenUE's infrastructure inspection policy.

Division engineering personnel field checked this circuit in 2010. DOJM Work Request number 21MT501595 was created to address various maintenance issues found as a result of this field check. This work will be completed in 2010.



## Appendix B

### **WPC Analysis and Remedial Action Report**

**Circuit Number** – 656055

**Division** – SEMO

**Area Served** – Dexter, Missouri

**SAIFI Value** – 3.35

#### **Analysis Results:**

Customer interruptions experienced on this circuit in 2009 included: failed underground primary and equipment; public vehicle accidents; tree-caused outages; and animal intrusions.

#### **Corrective Actions:**

A project will be created in 2010 to replace a portion of the failing underground concentric neutral cable.

A special overhead visual inspection will be performed on this circuit in 2010. This inspection will focus on animal guarding, tap fusing, and maintenance issues and any deficiencies identified will be addressed.

An overhead infrared inspection will be performed of this circuit in 2010. The repair work identified as a result of the inspection will be completed in accordance with AmerenUE's infrastructure inspection policy.



## Appendix B

### **WPC Analysis and Remedial Action Report**

**Circuit Number** – 876051

**Division** – Missouri Valley

**Area Served** – Blackwater, Missouri

**SAIFI Value** – 3.34

#### **Analysis Results:**

Customer interruptions experienced on this circuit in 2009 included: substation outages, which included substation equipment malfunction and prearranged switching outages; and a significant number of lock-outs of subtransmission lines which feed circuit's substation.

#### **Corrective Actions:**

Forestry crews performed hot-spot tree trimming on this circuit in 2009. This work discovered several hazardous and dead trees off the circuit right-of-way which required removal. In addition, the circuit was reprioritized on the tree trimming schedule to mitigate future vegetation related outages.

The main 3-phase backbone of the subtransmission feeder associated with this circuit was rebuilt in 2009, which will address a number of structural and reliability problems associated with this circuit.

The circuit was visually inspected in 2009 and an additional recloser was installed to mitigate momentary outages which have occurred on this circuit.

Overhead visual and infrared inspections are scheduled for this circuit in 2010. During these inspections the circuit will be inspected for deficiencies such as defective poles, insulator deterioration, loose or missing line hardware, or other structural problems. The repair work identified as a result of the inspection will be completed in accordance with AmerenUE's infrastructure inspection policy.



## Appendix B

### **WPC Analysis and Remedial Action Report**

**Circuit Number** – 628056

**Division** – SEMO

**Area Served** – Dexter, Missouri

**SAIFI Value** – 3.32

#### **Analysis Results:**

Customer interruptions experienced on this circuit in 2009 included: tree-caused outages; public vehicle accidents; and overhead equipment malfunctions.

#### **Corrective Actions:**

Tree trimming mid-cycle patrols are scheduled for this circuit in 2010.

A special overhead visual inspection will be performed on this circuit in 2010. This inspection will focus on animal guarding, tap fusing, and maintenance issues and any deficiencies identified will be addressed.

An overhead infrared inspection will also be performed on this circuit in 2010. The repair work identified as a result of the inspection will be completed in accordance with AmerenUE's infrastructure inspection policy.



## Appendix B

### WPC Analysis and Remedial Action Report

**Circuit Number** – 817053

**Division** – SEMO

**Area Served** – Anniston, Missouri

**SAIFI Value** – 3.19

#### **Analysis Results:**

Customer interruptions experienced on this circuit in 2009 included: a substation regulator malfunction; a public vehicle accident and a tree-caused primary wire failure.

#### **Corrective Actions:**

Tree trimming will be performed on this circuit in 2010.

A visual inspection of this circuit identified a large amount of wire in need of re-sagging, as a result of the 2009 ice storm.

A special overhead visual inspection will be performed on this circuit in 2010. This inspection will focus on animal guarding, tap fusing, and maintenance issues and any deficiencies identified will be addressed.

An overhead infrared inspection will be performed of this circuit in 2010. The repair work identified as a result of the inspection will be completed in accordance with AmerenUE's infrastructure inspection policy.

A project to re-conductor approximately two miles of this circuit will be submitted for inclusion in the 2011 budget.



## Appendix B

### **WPC Analysis and Remedial Action Report**

**Circuit Number** – 686051

**Division** – Central Ozarks

**Area Served** – Eldon, Missouri

**SAIFI Value** – 3.18

#### **Analysis Results:**

Customer interruptions experienced on this circuit in 2009 included: a tree-caused outage during a storm; and operator error. In November, 2009 work was completed on the new 676053 circuit, and 297 customers were transferred from the existing 686051 circuit to this new circuit. This transfer resulted in a reduction of the number of customers on this circuit from 872 to 575. This artificially inflated the SAIFI calculation for this circuit.

#### **Corrective Actions:**

Tree trimmed was last completed on this circuit in 2004.

Due to the actual low incidence of outages for this circuit, no additional work is planned for this circuit in 2010.



## Appendix B

### **WPC Analysis and Remedial Action Report**

**Circuit Number** – 256059

**Division** – Gateway

**Area Served** – Maryland Heights, Missouri Area

**SAIFI Value** – 3.08

#### **Analysis Results:**

Customer interruptions experienced on this circuit in 2009 included: an unknown circuit outage; tree-caused circuit outage; and an overhead malfunction due to broken primary.

#### **Corrective Actions:**

Tree trimming was completed on this circuit in 2010.

A Capacitor Inspection was performed on this circuit in 2009. Two deficiencies were identified and will be addressed.

An overhead infrared inspection is scheduled for this circuit in 2010. The repair work identified as a result of the inspection will be completed in accordance with AmerenUE's infrastructure inspection policy.



## Appendix B

### **WPC Analysis and Remedial Action Report**

**Circuit Number** – 560057

**Division** – Meramec Valley

**Area Served** – High Ridge, Missouri

**SAIFI Value** – 3.06

#### **Analysis Results:**

Customer interruptions experienced on this circuit in 2009 included: two (2) tree contact; and two (2) public vehicle accidents.

#### **Corrective Actions:**

Vegetation management crews performed hot-spot trimming on the affected areas as an immediate response to the tree contacts. In addition, aggressive tree trimming was performed on this circuit in 2009.

Overhead visual and infrared inspections are scheduled for this circuit in 2010. The repair work identified as a result of the inspection will be completed in accordance with AmerenUE's infrastructure inspection policy.

Division engineering personnel will continue to review and analyze any outages on this circuit and take corrective action when warranted.



## Appendix B

### **WPC Analysis and Remedial Action Report**

**Circuit Number** – 645053

**Division** – Boone Trails

**Area Served** – Defiance, Missouri

**SAIFI Value** – 3.06

#### **Analysis Results:**

Customer interruptions experienced on this circuit in 2009 included: a tree-caused device outage during a storm; and several outages due to tree contacts during storms and high winds. (Note: The underground residential subdivision, Augusta Shores, is served by a single-phase overhead line along a small dirt road through a wooded area, which has resulted in several problems on this circuit.)

#### **Corrective Actions:**

Spot tree trimming was performed to correct the problems identified on this circuit. In addition, the tree trimming schedule for this circuit has been changed from a 6-year rural cycle to a 4-year urban cycle.

Fuses were added to limit the number of customers affected beyond the Augusta Shores area.

The single-phase tap to the Augusta Shores area is being rebuilt to upgrade it to three-phase construction from the existing single-phase design. This will allow the residential loops in this area to be reconfigured to be feed from different sources, as well as from different phases. These upgrades are anticipated to significantly reduce the number of outages on this circuit.

This circuit will be split into two new circuits, circuits 647052 and 647053, when the Waterworks substation upgrade is completed. This upgrade should also improve reliability in this area of the distribution system.



## Appendix B

### **WPC Analysis and Remedial Action Report**

**Circuit Number** – 452053

**Division** – SEMO

**Area Served** – Braggadocio, Missouri

**SAIFI Value** – 3.04

#### **Analysis Results:**

Customer interruptions experienced on this circuit in 2009 included: primary wire failures; public vehicle accidents; and a tree-caused outage during a small storm.

#### **Corrective Actions:**

Tree trimming mid-cycle patrols will be performed on this circuit in 2010.

A project will be created to coordinate and add fuses to this circuit.

Overhead visual and infrared inspections will be performed on this circuit in 2010. The repair work identified as a result of the inspection will be completed in accordance with AmerenUE's infrastructure inspection policy.



## Appendix B

### **WPC Analysis and Remedial Action Report**

**Circuit Number** – 117053

**Division** – Gateway

**Area Served** – Maryland Heights, Missouri Area

**SAIFI Value** – 3.02

#### **Analysis Results:**

Customer interruptions experienced on this circuit in 2009 included: One (1) circuit outage due to guy anchor failure; and a broken crossarm during a thunderstorm

#### **Corrective Actions:**

Tree trimming was performed on this circuit in January 2010.

An overhead ground line inspection was performed on this circuit in 2009. As a result of this inspection, fourteen deficiencies were identified and will be addressed.

A Capacitor Inspection was performed on this circuit in 2009. Three deficiencies were identified and will be addressed.

An overhead infrared inspection is scheduled for this circuit in 2010. The repair work identified as a result of the inspection will be completed in accordance with AmerenUE's infrastructure inspection policy.



## Appendix B

### **WPC Analysis and Remedial Action Report**

**Circuit Number** – 914059

**Division** – Missouri Valley

**Area Served** – Rural Moberly, Missouri

**SAIFI Value** – 3.01

#### **Analysis Results:**

Customer interruptions experienced on this circuit in 2009 included: recloser failures; tree contacts; and animal intrusions.

#### **Corrective Actions:**

Animal guards were installed on circuit transformers and reclosers to mitigate animal outages.

Overhead visual and infrared inspections are scheduled for this circuit in 2010. During these inspections the circuit will be inspected for deficiencies such as defective poles, insulator deterioration, loose or missing line hardware, or other structural problems. The repair work identified as a result of the inspection will be completed in accordance with AmerenUE's infrastructure inspection policy.



## Appendix B

### **WPC Analysis and Remedial Action Report**

**Circuit Number** – 647051

**Division** – Boone Trails

**Area Served** – Weldon Spring, Missouri

**SAIFI Value** – 3.00

#### **Analysis Results:**

This circuit only serves one primary metered customer, Public Water Supply District #2. The customer interruptions experienced on this circuit in 2009 were associated with customer-owned equipment behind AmerenUE's primary metering point. As a result, AmerenUE was not responsible for the outages to this customer.

#### **Corrective Actions:**

The outage data associated with this circuit has been reviewed and corrected to indicate that this circuit contains Customer Equipment.

This customer will be transferred to a new circuit, 647051, in conjunction with the upgrade of the Waterworks substation which will eliminate the portion of the AmerenUE lines on a private right of way. In addition, this customer is planning to pay AmerenUE to construct a new line to an alternate primary meter location in lieu of extensive line work on their own property, which will significantly improve the customer's reliability and reduce or eliminate their outages.



## Appendix B

### **WPC Analysis and Remedial Action Report**

**Circuit Number** – 656053

**Division** – SEMO

**Area Served** – Dexter, Missouri

**SAIFI Value** – 2.99

#### **Analysis Results:**

Customer interruptions experienced on this circuit in 2009 included: primary and pole failures during a small storm in July, 2009; and public vehicle accidents.

#### **Corrective Actions:**

Overhead visual and infrared inspections will be performed on this circuit in 2010. The repair work identified as a result of the inspection will be completed in accordance with AmerenUE's infrastructure inspection policy.



## Appendix B

### WPC Analysis and Remedial Action Report

**Circuit Number** – 136052

**Division** – RiverBluffs

**Area Served** – Oakville, Missouri St. Louis County, Missouri

**SAIFI Value** – 2.96

#### **Analysis Results:**

Customer interruptions experienced on this circuit in 2009 included: three (3) overhead equipment failures. (Note: In all cases the outages were due to primary spans coming together in high winds.

#### **Corrective Actions:**

Tree trimming was last completed on this circuit in 2008. The next scheduled tree trimming to be performed on this circuit is in 2012.

This circuit was patrolled following the outage occurrences. The patrols determined that slack conductors were coming together and causing the outages. DOJM Work Request Number 21MT474876 was created to correct the problem. The work was completed in June, 2009. No further outages have occurred on this circuit since these repairs were completed.

In March, 2009, relay engineering personnel checked breaker settings at the substation and made minor adjustments to these settings.

Several other DOJM Work Requests were completed in 2009 to address potential problems with equipment on the circuit. These included:

DOJM Work Request number 21MT474535, which removed slack from the two spans of the circuit, was completed in April, 2009.

DOJM Work Request number 21MT474537, which installed fuses on this circuit, was completed in April, 2009.

DOJM Work Request number 21MT474539, which removed slack from the two spans of the circuit, was completed in April, 2009.

DOJM Work Request number 21MT474744, which installed animal guards on some transformers on this circuit, was completed in May, 2009.

DOJM Work Request number 21MT475619, which replaced a recloser on this circuit, was completed in April, 2009.

The circuit was patrolled by division engineering personnel in February, 2010.



## Appendix B

An infrared inspection was completed on this circuit in 2009. This circuit will receive an overhead visual inspection, a ground line inspection, and an infrared inspection in 2010. The repair work identified as a result of the inspection will be completed in accordance with AmerenUE's infrastructure inspection policy.



## Appendix B

### **WPC Analysis and Remedial Action Report**

**Circuit Number** – 543056

**Division** – Boone Trails

**Area Served** – St. Peters, Missouri

**SAIFI Value** – 2.89

#### **Analysis Results:**

Customer interruptions experienced on this circuit in 2009 included: tree contact; device outages; animal intrusions; and equipment malfunctions. (Note: The majority of the tree contacts occurred along a specific section of the circuit.)

#### **Corrective Actions:**

Tree trimming of this circuit was completed in early 2010. A total of 40 additional trees were removed as a result of the prescriptive tree trimming.

As a result of the CI which occurred in 2009 several actions were taken. Hot-spot tree trimming was performed along the section of the circuit where the most tree contacts occurred to help prevent future circuit outages. In addition, additional tap fusing was installed in October, 2009 under DOJM work request number 25SC047413 to help isolate this section of circuit from the rest of the circuit.

An overhead visual inspection and an infrared inspection will be conducted on this circuit in 2010. The repair work identified as a result of the inspection will be completed in accordance with AmerenUE's infrastructure inspection policy.

The CI caused by animal intrusions and equipment malfunctions will be evaluated by division engineering personnel to determine whether further action is required.



## Appendix B

### **WPC Analysis and Remedial Action Report**

**Circuit Number** – 160006

**Division** – Archview

**Area Served** – Saint Louis City, Missouri

**SAIFI Value** – 2.88

#### **Analysis Results:**

This 4.16 kV circuit consists primarily of underground construction, with some overhead construction as well. Customer interruptions experienced on this circuit in 2009 included: a circuit outage caused by an underground cable failure on 34kV subtransmission circuit HLST-77; a circuit outage for unknown reasons; and, on two separate occasions, circuit outages due to a cable failure when the 160006 distribution circuit was tied to another distribution circuit.

#### **Corrective Actions:**

The abnormal switching condition between this circuit and circuit 160002, which resulted in both circuits being paralleled at a pad mount switchgear unit, has been corrected.

The 34kV subtransmission circuit, HLST-77, will be reviewed by division engineering personnel to determine the cause of the momentary and cable failures.

The circuit will have an overhead visually inspected performed by division engineering and estimating personnel. Any repair work identified as a result of this inspection will be addressed.

An overhead visually and infrared inspected will be performed on this circuit in 2010. The repair work identified as a result of the inspection will be completed in accordance with AmerenUE's infrastructure inspection policy.

Division engineering personnel will perform a DEW power flow analysis on this circuit, including both normal and contingency conditions, to ensure that the circuit has component rating overloads and to ensure that system voltages are within prescribed limits.



## Appendix B

### **WPC Analysis and Remedial Action Report**

**Circuit Number** – 455055

**Division** – SEMO

**Area Served** – Caruthersville, Missouri

**SAIFI Value** – 2.82

#### **Analysis Results:**

Customer interruptions experienced on this circuit in 2009 included: public vehicle accidents; tree-caused outages; and overhead malfunctions during storms.

#### **Corrective Actions:**

Ten miles of the 34kV and associated under-build will be reconductored and a new 34kV loop constructed on this circuit.

A special overhead visual inspection will be performed on this circuit in 2010. This inspection will focus on animal guarding, tap fusing, and maintenance issues and any deficiencies identified will be addressed.

An overhead infrared inspection will also be performed on this circuit in 2010. The repair work identified as a result of the inspection will be completed in accordance with AmerenUE's infrastructure inspection policy.



## Appendix B

### WPC Analysis and Remedial Action Report

**Circuit Number** – 464054

**Division** – SEMO

**Area Served** – Portageville, Missouri

**SAIFI Value** – 2.82

#### **Analysis Results:**

Customer interruptions experienced on this circuit in 2009 included: tree-caused outages; public vehicle outages; and primary wire failures during storms.

#### **Corrective Actions:**

Tree trim will be performed on this circuit in 2010.

Fuses were added to this circuit under DOJM Work Request number 2TSE089914. This work request was completed in October, 2009.

The substation breaker was replaced and the regulator bank was rebuilt in 2009.

A special overhead visual inspection will be performed on this circuit in 2010. This inspection will focus on animal guarding, tap fusing, and maintenance issues and any deficiencies identified will be addressed.

An overhead infrared inspection will be performed on this circuit in 2010. The repair work identified as a result of the inspection will be completed in accordance with AmerenUE's infrastructure inspection policy.



## Appendix B

### **WPC Analysis and Remedial Action Report**

**Circuit Number** – 461055

**Division** – SEMO

**Area Served** – Hayti, Missouri

**SAIFI Value** – 2.79

#### **Analysis Results:**

Customer interruptions experienced on this circuit in 2009 included: lightning strikes on the 34kV subtransmission system; substation breaker malfunctions; and overhead equipment malfunctions.

#### **Corrective Actions:**

A portion of this circuit will be rebuilt.

A special overhead visual inspection will be performed on this circuit in 2010. This inspection will focus on animal guarding, tap fusing, and maintenance issues and any deficiencies identified will be addressed.

An overhead infrared inspection will also be performed on this circuit in 2010. The repair work identified as a result of the inspection will be completed in accordance with AmerenUE's infrastructure inspection policy.



## Appendix B

### **WPC Analysis and Remedial Action Report**

**Circuit Number** – 268004

**Division** – Archview

**Area Served** – University City, Missouri

**SAIFI Value** – 2.78

#### **Analysis Results:**

Customer interruptions experienced on this circuit in 2009 included: tree-caused outages.

#### **Corrective Actions:**

Tree trimming will be performed on this circuit in 2010

Overhead visual and infrared inspections will be performed on this circuit in 2010. The repair work identified as a result of the inspection will be completed in accordance with AmerenUE's infrastructure inspection policy.



## Appendix B

### **WPC Analysis and Remedial Action Report**

**Circuit Number** – 135004

**Division** – RiverBluffs

**Area Served** – Western Edge of South St. Louis City

**SAIFI Value** – 2.78

#### **Analysis Results:**

Customer interruptions experienced on this circuit in 2009 included: public vehicle accident; tree failure; an overhead equipment failure; and operator error.

#### **Corrective Actions:**

Tree trimming was last completed on this circuit in 2007. The circuit is next scheduled for tree trimming in 2011. In February, 2010 two spot tree trimming requests were sent to Vegetation Management.

The circuit was patrolled by division engineering personnel in February 2010. DOJM Work Request number 21MT497900 was created to replace some solid blade switches with three 140T fuses on a radial tap. This work request was completed in February, 2010.

This circuit is scheduled for an overhead visual and infrared inspection in 2010. The repair work identified as a result of the inspection will be completed in accordance with AmerenUE's infrastructure inspection policy.



## Appendix B

### **WPC Analysis and Remedial Action Report**

**Circuit Number** – 550058

**Division** – Meramec Valley

**Area Served** – Crystal City, Missouri

**SAIFI Value** – 2.70

#### **Analysis Results:**

Customer interruptions experienced on this circuit in 2009 included: tree failures; and equipment failures. (Note: The circuit consists of very old three-phase backbone located in areas that are very difficult to access. In addition, much of the circuit backbone is constructed as under-build on a subtransmission circuit.)

#### **Corrective Actions:**

Aggressive trim trimming was performed on this circuit in 2009.

This circuit underwent infrared inspection in 2009. However, the bad jumper which resulted in one of the circuit outages was not detected.

The 5.5 miles of three-phase backbone will undergo a special infrared inspection in 2010. Any items discovered by the scan will be corrected.



## Appendix B

### **WPC Analysis and Remedial Action Report**

**Circuit Number** – 123057

**Division** – Gateway

**Area Served** – Kirkwood, Missouri Area

**SAIFI Value** – 2.67

#### **Analysis Results:**

Customer interruptions experienced on this circuit in 2009 included: tree failures; and two (2) overhead equipment failures.

#### **Corrective Actions:**

Tree trimming on this circuit will be performed in 2010. In addition, hot-spot tree trimming was performed on this circuit in 2009.

DOJM Work Request number 21MT488814 was created in order to replace worn wire. This work request was completed in December, 2009.

DOJM Work Request number 21MT477885 was created in order to replace or remove poles, cross arms, primary wires, and slack from primary and secondary wires in several locations on the circuit. This work request was completed in July, 2009.

DOJM Work Request number 21MT471609 was created in order to repair a V brace. This work request was completed in January, 2009.

DOJM Work Request number 21MT476749 was created in order to remove five sectionalizers, replace one recloser, and install eight fuses. This work request was completed in June, 2009.

DOJM Work Request number 21MT493844 was created in order to install one fuse on the circuit. This work request was completed in December, 2009.

An infrared inspection of this circuit was performed in 2009. DOJM Work Request number 21MT482556 was created in order to repair a hot line clamp. This work request was completed in July, 2009. DOJM Work Request number 21MT483193 was created in order to repair a single bolt parallel groove clamp. The repair was made in August, 2009.

A ground line inspection of the circuit was performed in 2008 resulting in 26 separate DOJM Work Requests. All work requests have been completed.

An overhead infrared inspection is scheduled for this circuit in 2010. The repair work identified as a result of the inspection will be completed in accordance with AmerenUE's infrastructure inspection policy.



## Appendix B

### **WPC Analysis and Remedial Action Report**

**Circuit Number** – 672053

**Division** – Boone Trails

**Area Served** – Louisiana, Missouri

**SAIFI Value** – 2.66

#### **Analysis Results:**

Customer interruptions experienced on this circuit in 2009 included: trees; overhead failures; and animal intrusions. (Note: This circuit runs cross country until it reaches the town of Louisiana, Missouri.)

#### **Corrective Actions:**

This circuit is being relocated from its current cross country configuration to a route along Pike Road 251 in 2010 and to Pike Road 269 in 2011.

Reclosers and fuses will be added to taps along this circuit. The tap on Highway UU has experienced many outages and as a result, fuses and reclosers will be added to this portion of the circuit and part of the tap along the creek will be moved to the roadway. Lastly, a third phase will be added to the circuit in 2010 to allow load to be balanced on the circuit and to allow better coordination with protective devices.



## Appendix B

### **WPC Analysis and Remedial Action Report**

**Circuit Number** – 019052

**Division** – SEMO

**Area Served** – Belgrade, Missouri

**SAIFI Value** – 2.62

#### **Analysis Results:**

Customer interruptions experienced on this circuit in 2009 included: overhead primary problems; recloser trips during storms; and animal intrusions.

#### **Corrective Actions:**

DOJM Work Request number 28IR030746 was created in order to install animal guards along this circuit. This work request was completed in January, 2009.

DOJM Work Request number 28IR031714 was created in order to relocate and added reclosers to this circuit. This work request was completed in January, 2010.

DOJM Work Request number 28IR033498 was created in order to relocate taps to different phases and replace reclosers on this circuit. This work request was completed in March, 2010.

A special overhead visual inspection will be performed on this circuit in 2010. This inspection will focus on animal guarding, tap fusing, and maintenance issues and any deficiencies identified will be addressed.

An overhead infrared inspection will be performed on this circuit in 2010. The repair work identified as a result of the inspection will be completed in accordance with AmerenUE's infrastructure inspection policy.



## Appendix B

### **WPC Analysis and Remedial Action Report**

**Circuit Number** – 685053

**Division** – SEMO

**Area Served** – Matthews, Missouri

**SAIFI Value** – 2.60

#### **Analysis Results:**

Customer interruptions experienced on this circuit in 2009 included: fallout from 2009 ice storm; a substation malfunction; and primary wire failures.

#### **Corrective Actions:**

A special overhead visual inspection will be performed on this circuit in 2010. This inspection will focus on animal guarding, tap fusing, and maintenance issues and any deficiencies identified will be addressed.

An overhead infrared inspection will also be performed on this circuit in 2010. The repair work identified as a result of the inspection will be completed in accordance with AmerenUE's infrastructure inspection policy.



## Appendix B

### **WPC Analysis and Remedial Action Report**

**Circuit Number** – 103001

**Division** – Gateway

**Area Served** – Ladue, Missouri Area

**SAIFI Value** – 2.57

#### **Analysis Results:**

Customer interruptions experienced on this circuit in 2009 included: primary down due to an uprooted tree during high winds; a public vehicle accident; and operator error causing an outage of one of the substation' supply circuits.

#### **Corrective Actions:**

Tree trimming on this circuit was last completed in 2007. The circuit is next scheduled for tree trimming in 2011.

The substation relaying scheme has been modified to prevent an extended outage when at least one supply circuit is restored after a loss of both supplies.

DOJM Work Request number 21MT498193 was created in order to install additional fuses, remove excess primary wire and poles, and replace some poles. This work request is scheduled to be completed in August, 2010.

DOJM Work Request number 21MT498195 was created in order to install fuses on CSP transformers on the circuit. This work request is scheduled to be completed in July, 2010.

An overhead ground line inspection of the circuit was performed in 2009. This resulted in the creation of seven separate DOJM Work Requests. All work resulting from this inspection is scheduled to be completed in 2010.

An overhead infrared inspection is scheduled for this circuit in 2010. The repair work identified as a result of the inspection will be completed in accordance with AmerenUE's infrastructure inspection policy.



## Appendix B

### **WPC Analysis and Remedial Action Report**

**Circuit Number** – 628055

**Division** – SEMO

**Area Served** – Dexter, Missouri

**SAIFI Value** – 2.57

#### **Analysis Results:**

Customer interruptions experienced on this circuit in 2009 included: tree-caused outages.

#### **Corrective Actions:**

Tree trimming will be performed on this circuit in 2010.

A special overhead visual inspection will be performed on this circuit in 2010. This inspection will focus on animal guarding, tap fusing, and maintenance issues and any deficiencies identified will be addressed.

An overhead infrared inspection will be performed on this circuit in 2010. The repair work identified as a result of the inspection will be completed in accordance with AmerenUE's infrastructure inspection policy.



## Appendix B

### **WPC Analysis and Remedial Action Report**

**Circuit Number** – 731051

**Division** – Boone Trails

**Area Served** – Frankford, Missouri

**SAIFI Value** – 2.55

#### **Analysis Results:**

Customer interruptions experienced on this circuit in 2009 included: trees; animal intrusions; and overhead failures. (Note: This circuit is consists of very old #4 copper and 4ACSR wire that has been spliced many times.)

#### **Corrective Actions:**

Division engineering personnel will review this circuit to identify locations that require upgrading as well as evaluating the need for another substation east of Frankford to create a tie and increase reliability. Upon review, projects will be submitted to the budget for potential approval.



## Appendix B

### **WPC Analysis and Remedial Action Report**

**Circuit Number** – 699051

**Division** – SEMO

**Area Served** – Minor, Missouri

**SAIFI Value** – 2.53

#### **Analysis Results:**

Customer interruptions experienced on this circuit in 2009 included: primary wire failure; and supply static wire failures.

#### **Corrective Actions:**

Tree trimming will be performed on this circuit in 2010.

An overhead visual and infrared inspection will be performed on this circuit in 2010. The repair work identified as a result of the inspection will be completed in accordance with AmerenUE's infrastructure inspection policy.



## Appendix B

### **WPC Analysis and Remedial Action Report**

**Circuit Number** – 289054

**Division** – RiverBluffs

**Area Served** – Eureka, Missouri

**SAIFI Value** – 2.51

#### **Analysis Results:**

Customer interruptions experienced on this circuit in 2009 included: two (2) BAB-75 subtransmission line lock-outs; and a public vehicle accident. (Note: The majority of this circuit is located along two lane rural highways and roadways and is truck accessible in most areas. This circuit mainly provides power to customers in Jefferson County and has limited tie capacity to other three-phase lines in the area.)

#### **Corrective Actions:**

Tree trimming was completed on this circuit in 2007. In addition, the circuit is scheduled for a mid-cycle tree trimming patrol in 2010.

This circuit had an overhead visual inspection performed on it in 2009. The repair work identified as a result of this inspection will be completed in 2010.

Another overhead visual inspection of this circuit has been scheduled for 2010. An infrared inspection will also be performed on this circuit as part of the visual inspection. Repair work identified as a result of this inspection will be completed in accordance with AmerenUE's infrastructure inspection program process.

Division Engineers are evaluating the feasibility of building future potential tie(s) to other circuits to improve the reliability of this circuit.

The subtransmission line BAB-75 will also have an overhead visual inspection performed on it in 2010. The repair work identified as a result of the inspection will be completed in accordance with AmerenUE's infrastructure inspection policy.



## Appendix B

### **WPC Analysis and Remedial Action Report**

**Circuit Number** – 646052

**Division** – SEMO

**Area Served** – Cape Girardeau, Missouri

**SAIFI Value** – 2.51

#### **Analysis Results:**

Customer interruptions experienced on this circuit in 2009 included: tree-caused outages; animal intrusions; and overhead malfunctions.

#### **Corrective Actions:**

Tree trimming was performed on this circuit in 2009.

Five miles of this circuit will be reconductored in 2010.

A special overhead visual inspection will be performed on this circuit in 2010. This inspection will focus on animal guarding, tap fusing, and maintenance issues and any deficiencies identified will be addressed.

An overhead infrared inspection will be performed on this circuit in 2010. The repair work identified as a result of the inspection will be completed in accordance with AmerenUE's infrastructure inspection policy.



## Appendix B

### **WPC Analysis and Remedial Action Report**

**Circuit Number** – 256051

**Division** – Gateway

**Area Served** – Maryland Heights, Missouri Area

**SAIFI Value** – 2.50

#### **Analysis Results:**

Customer interruptions experienced on this circuit in 2009 included: an overhead malfunction due to a broken primary wire; and tree-caused circuit outage.

#### **Corrective Actions:**

This circuit underwent special tree trimming in 2009. An additional tree trimming on this circuit is also scheduled in 2010.

DOJM Work Request number 21MT476592 was created in order to install a fused switch and add animal protection to a transformer. This work request was completed in August, 2009.

DOJM Work Request number 21MT476591 was created in order to install a fused switch and add animal protection to a transformer. This work request was completed in August 2009.

A Recloser inspection was performed on this circuit in 2009. Two deficiencies were identified and will be addressed.

A Capacitor inspection was performed on this circuit in 2009. Two deficiencies were identified and will be addressed.

An overhead infrared inspection is scheduled for this circuit in 2010. The repair work identified as a result of the inspection will be completed in accordance with AmerenUE's infrastructure inspection policy.



## Appendix B

### WPC Analysis and Remedial Action Report

**Circuit Number** – 284052

**Division** – Gateway

**Area Served** – St. Ann, Missouri

**SAIFI Value** – 2.48

#### **Analysis Results:**

Customer interruptions experienced on this circuit in 2009 included: tree failure during a storm; and primary conductors failures during storm or rain conditions.

#### **Corrective Actions:**

Tree trimming was last performed on this circuit in 2008.

An overhead visual and infrared inspection is scheduled on this circuit in 2010. The repair work identified as a result of the inspection will be completed in accordance with AmerenUE's infrastructure inspection policy.

DOJM Work Request number 21MT498209, which replaced solid blade switches with reclosers, was completed in February, 2010.

DOJM Work Request number 21MT462103, which replaced solid blade switches with reclosers, was completed in March, 2009.

DOJM Work Request number 21MT472256, which upgraded a transformer, was completed in March, 2009.

DOJM Work Request number 21MT473411, which replaced animal guards and lightning arrestors on the circuit, was completed in July, 2009.

DOJM Work Request number 21MT472335, which installed animal protection and replaced lightning arrestors, was completed in April, 2009.

DOJM Work Request number 21MT475989, which replaced solid blade switches with reclosers, was completed in June, 2009.

An overhead infrared inspection was performed this circuit in 2009. No deficiencies were found.



## Appendix B

### **WPC Analysis and Remedial Action Report**

**Circuit Number** – 451051

**Division** – SEMO

**Area Served** – Viburnum, Missouri

**SAIFI Value** – 2.46

#### **Analysis Results:**

This circuit experienced customer interruptions in 2009 due to storms in June.

#### **Corrective Actions:**

DOJM Work Request number 28IR032806 was created in order to add fuses to this circuit to minimize future outages. This work request was completed in August, 2009.

DOJM Work Request number 28IR033266 was created in order to add fuses to unfused taps and animal guards to transformers. This work request is expected to be completed in 2010.

Overhead visual, ground line, and infrared inspections will be performed on this circuit in 2010. The repair work identified as a result of the inspection will be completed in accordance with AmerenUE's infrastructure inspection policy.



## Appendix B

### WPC Analysis and Remedial Action Report

**Circuit Number** – 258052

**Division** – Gateway

**Area Served** – Kirkwood – Fenton, Missouri Area

**SAIFI Value** – 2.42

#### **Analysis Results:**

Customer interruptions experienced on this circuit in 2009 included: circuit outage due to public vehicle accident; and an unknown cause (suspected to be due to a tree failure during a thunder storm).

#### **Corrective Actions:**

Tree trimming was last completed on this circuit in 2008. A mid-cycle tree trimming inspection of this circuit is scheduled for 2010.

DOJM Work Request number 21MT473419 was created to install reclosers on the circuit to isolate an industrial area in the event of public vehicle accidents. This work request was completed in November, 2009.

DOJM Work Request number 21MT473416 was created to reduce wire sag and to install additional circuit protection. This work request was completed in November, 2009.

DOJM Work Requests numbers 21MT476652, 21MT476655, and 21MT476610 were created to install additional fuses on the circuit. These work requests were completed in 2009.

An infrared inspection of this circuit was performed in 2009. As a result of this inspection, DOJM Work Request number 21MT483173 was created in order to repair a hot line clamp. This work request was completed in August, 2009. DOJM Work Request number 21MT482088 was created to repair a single bolt PG clamp. This work request was completed in July, 2009.

Overhead visual, ground line, and infrared inspections are scheduled for this circuit in 2010. The repair work identified as a result of the inspection will be completed in accordance with AmerenUE's infrastructure inspection policy.



## Appendix B

### WPC Analysis and Remedial Action Report

**Circuit Number** – 215054

**Division** – Gateway

**Area Served** – Black Jack, Missouri Area

**SAIFI Value** – 2.41

#### **Analysis Results:**

Customer interruptions experienced on this circuit in 2009 included: tree-caused broken wire; lightning during a storm; transformer failure; and a prearranged maintenance outage to make repairs following a public vehicle accident.

#### **Corrective Actions:**

Tree trimming was last performed on this circuit in 2009.

Division personnel designed and completed a new circuit which splits circuit 260053. This provides additional tie capacity for this circuit.

An overhead infrared inspection was performed on this circuit in 2009.

The circuit was patrolled in 2009. DOJM Work Request number 21MT478819, created to reconnect a lightning arrestor, was completed in January, 2010.

DOJM Work Request number 21MT494890, created to add fuses to five CSP transformers, was completed in January, 2010.

A project is in design to provide relief to the circuit by creating a new 215056 circuit which will pick up the northern portion of this circuit. This project is planned to be completed in 2010. The work will be performed under DOJM Work Request numbers 21MT469482, 21MT469485, and 21MT469484.

An overhead infrared inspection is scheduled for this circuit in 2010. The repair work identified as a result of the inspection will be completed in accordance with AmerenUE's infrastructure inspection policy.

Division engineering personnel performed a field check of this circuit in the first quarter of 2010. Any problems found during this field check are being addressed.



## Appendix B

### **WPC Analysis and Remedial Action Report**

**Circuit Number** – 488052

**Division** – SEMO

**Area Served** – Potosi, Missouri

**SAIFI Value** – 2.41

#### **Analysis Results:**

Customer interruptions experienced on this circuit in 2009 included: animal intrusions; and tree-caused outages.

#### **Corrective Actions:**

Tree trimming will be performed on this circuit in 2010.

DOJM Work Request numbers 28IR032564 and 28IR033152 were created in order to add reclosers to this circuit. These work requests were completed in June and August, 2009.

A special overhead visual inspection will be performed on this circuit in 2010. This inspection will focus on animal guarding, tap fusing, and maintenance issues and any deficiencies identified will be addressed.

An overhead infrared inspection will also be performed on this circuit in 2010. The repair work identified as a result of the inspection will be completed in accordance with AmerenUE's infrastructure inspection policy.



## Appendix B

### **WPC Analysis and Remedial Action Report**

**Circuit Number** – 082052

**Division** – Archview

**Area Served** – Saint Louis City, Missouri

**SAIFI Value** – 2.38

#### **Analysis Results:**

Customer interruptions experienced on this circuit in 2009 included: an animal intrusion; and an outage of unknown cause. (Note: A substation distribution breaker showed a protective relay problem that, upon further inspection, was found to be due to a family of opossums found inside the pad mount switchgear.)

#### **Corrective Actions:**

As a result of the two outages that occurred on this circuit, Distribution Operating personnel inspected customer indoor substations and customer primary switchgears to determine if they were abnormally switched and to inspect them for possible problems. No abnormal switching or evidence of faults was found.

Division engineering personnel and Distribution Standards personnel examined the pad mount switchgear where the animals were found. (Initial visual inspections did not find any animal related problems.) The opossums had entered the pad mount transformer through a small hole under the transformer pad. To prevent any future animal related outages at this switchgear, the family of opossums was removed and the entry hole was filled.

Division engineering and construction personnel will complete a detailed visual inspection of this underground circuit's pad mount switchgear and customer-owned primary switchgear.

Division engineering personnel will perform power flow analysis on this circuit, including both normal and contingency conditions, to ensure that the circuit has component rating overloads and to ensure that system voltages are within prescribed limits.



## Appendix B

### **WPC Analysis and Remedial Action Report**

**Circuit Number** – 465051

**Division** – SEMO

**Area Served** – Steele, Missouri

**SAIFI Value** – 2.38

#### **Analysis Results:**

Customer interruptions experienced on this circuit in 2009 included: substation breaker that was operating in manual control; and tree-caused outages.

#### **Corrective Actions:**

DOJM Work Request number 2TSE090754 was created in order to install fuses to un-fused taps on this circuit. This work request was completed in January, 2010.

A special overhead visual inspection will be performed on this circuit in 2010. This inspection will focus on animal guarding, tap fusing, and maintenance issues and any deficiencies identified will be addressed.

An overhead infrared inspection will also be performed on this circuit in 2010. The repair work identified as a result of the inspection will be completed in accordance with AmerenUE's infrastructure inspection policy.



## Appendix B

### WPC Analysis and Remedial Action Report

**Circuit Number** – 141005

**Division** – Gateway

**Area Served** – Olivette, Missouri Area

**SAIFI Value** – 2.38

#### **Analysis Results:**

Customer interruptions experienced on this circuit in 2009 included: a public vehicle accident; and an underground equipment failure.

#### **Corrective Actions:**

A mid-cycle tree trimming inspection was performed on this circuit in 2009.

The underground primary fault was repaired under DOJM Work Request number 21MT484528 in July, 2009.

An overhead visual inspection was performed on this circuit in 2009. This inspection identified the need for several repairs, including overhead guys, down guys, pole tops, insulators, v-braces, grounds, woodpecker holes, risers, crossarms, transformers, and poles. The repairs will be made under DOJM Work Request numbers 21MT488376, 21MT488375, 21MT488374, and 21MT488373. This work is expected to be completed in 2010

An overhead infrared inspection is scheduled for this circuit in 2010. The repair work identified as a result of the inspection will be completed in accordance with AmerenUE's infrastructure inspection policy.

Division engineering personnel performed a field check of this circuit in the first quarter of 2010. DOJM Work Request number 21MT501609 was created to address various maintenance issues identified as a result of this field check. It is expected to be completed in 2010.



## Appendix B

### WPC Analysis and Remedial Action Report

**Circuit Number** – 253053

**Division** – RiverBluffs

**Area Served** – Oakville, Missouri

**SAIFI Value** – 2.38

#### **Analysis Results:**

Customer interruptions experienced on this circuit in 2009 included: public vehicle accident; and overhead backbone conductor down due to tree failure.

#### **Corrective Actions:**

Tree trimming was last completed on this circuit in 2006. This circuit is next scheduled for tree trimming in 2010. In addition, in February, 2010, three hot-spot tree trimming requests were sent to Vegetation Management to trim limbs away from primary conductors.

All taps with trees in the vicinity have already been fused or will be in the near future as a DOJM work request has been created to install three new tap fuses on this circuit.

An infrared inspection was performed on this circuit in 2009. This inspection identified a hot-spot on a jumper wire and DOJM Work Request number 21MT482881 was created to replace the jumper wire and clamps. This work request was completed in July, 2009.

The circuit was patrolled by division engineering personnel in February, 2010. The following DOJM work request numbers were created to address improvements identified as a result of this patrol:

DOJM Work Request number 21MT497986 was created to install 140T fuses in order to isolate a three-phase tap. This work request was completed in February, 2010.

DOJM Work Request number 21MT497967 to install an animal guard on a transformer was completed in February, 2010.

DOJM Work Request number 21MT489834 was created to replace a broken cross arm. This work request was completed in February, 2010.

This circuit is scheduled for an overhead visual and infrared inspection in 2010. The repair work identified as a result of the inspection will be completed in accordance with AmerenUE's infrastructure inspection policy.



## Appendix B

### **WPC Analysis and Remedial Action Report**

**Circuit Number** – 456057

**Division** – SEMO

**Area Served** – Deering, Missouri

**SAIFI Value** – 2.37

#### **Analysis Results:**

Customer interruptions experienced on this circuit in 2009 included: bird intrusion into a substation; and a 34kV fuse failure in a substation during a storm.

#### **Corrective Actions:**

A special overhead visual inspection will be performed on this circuit in 2010. This inspection will focus on animal guarding, tap fusing, and maintenance issues and any deficiencies identified will be addressed.

An overhead infrared inspection will be performed on this circuit in 2010. The repair work identified as a result of the inspection will be completed in accordance with AmerenUE's infrastructure inspection policy.



## Appendix B

### **WPC Analysis and Remedial Action Report**

**Circuit Number** – 517053

**Division** – Meramec Valley

**Area Served** – Hillsboro and Dittmer, Missouri

**SAIFI Value** – 2.35

#### **Analysis Results:**

Customer interruptions experienced on this circuit in 2009 included: a failed voltage regulator resulting in a pole fire; and a lightning strike on a pole which caused the primary wire to burn.

#### **Corrective Actions:**

Aggressive trim trimming was completed on this circuit in December, 2009.

This circuit has been reducted over the past 10 years and is in good physical condition. The circuit had existing backbone reclosers installed to limit outages caused by failures downstream of their locations. However, the two outages which occurred on this circuit took place upstream of the reclosers.

Unfortunately, there is no economically feasible way to add tie capacity to this circuit. There are future plans for the addition of a Ware substation, but this addition probably will not occur for at least ten years or until the circuit load justifies the expense.

Division engineering personnel have requested an infrared inspection to be performed on the backbone portion of the circuit in 2010. The repair work identified as a result of the inspection will be completed in accordance with AmerenUE's infrastructure inspection policy.



## Appendix B

### **WPC Analysis and Remedial Action Report**

**Circuit Number** – 575056

**Division** – Meramec Valley

**Area Served** – Arnold, Missouri

**SAIFI Value** – 2.34

#### **Analysis Results:**

Customer interruptions experienced on this circuit in 2009 included: public caused outages; public vehicle accidents; operating errors; and animal contact.

#### **Corrective Actions:**

Aggressive tree trimming was performed on this circuit in 2009.

As part of the PowerOn program, project PAR 1047 was created to convert an inaccessible 3-phase overhead line that had caused previous outage problems to underground distribution. This work was completed in April 2009.

Overhead visual and infrared inspections are scheduled for this circuit in 2010. The repair work identified as a result of the inspection will be completed in accordance with AmerenUE's infrastructure inspection policy.

Division engineering personnel will continue to review and analyze any outages on this circuit and take corrective action when warranted.



## Appendix B

### **WPC Analysis and Remedial Action Report**

**Circuit Number** – 878006

**Division** – SEMO

**Area Served** – Minor, Missouri

**SAIFI Value** – 2.34

#### **Analysis Results:**

Customer interruptions experienced on this circuit in 2009 included: a failed lightning arrester; and a substation outage during February 2009 ice storm.

#### **Corrective Actions:**

Tree trimming will be performed on this circuit in 2010.

Lightning protection was added to the Minor 71 and 72 subtransmission circuits in late 2009. These circuits feed this distribution circuit's substation.

A special overhead visual inspection will be performed on this circuit in 2010. This inspection will focus on animal guarding, tap fusing, and maintenance issues and any deficiencies identified will be addressed.

An overhead infrared inspection will also be performed on this circuit in 2010. The repair work identified as a result of the inspection will be completed in accordance with AmerenUE's infrastructure inspection policy.



## Appendix B

### **WPC Analysis and Remedial Action Report**

**Circuit Number** – 159003

**Division** – Archview

**Area Served** – Saint Louis City, Missouri

**SAIFI Value** – 2.33

#### **Analysis Results:**

Customer interruptions experienced on this circuit in 2009 included: a public vehicle accident which damaged the pole and wires at this circuit's tie switch; failure of the underground feeder exit cable; tree contact and broken limbs; and overhead malfunctions.

#### **Corrective Actions:**

Tree trimming was last performed on this circuit in 2009.

DOJM Work Request number 21MT480720, created to replace the failed underground cable which resulted in one of the circuit outages, was completed in June, 2009.

This circuit will be reviewed by division engineering personnel for additional tap fusing and fuse coordination.

An overhead visual and infrared inspection will be performed on this circuit in 2010. The repair work identified as a result of the inspection will be completed in accordance with AmerenUE's infrastructure inspection policy.



## Appendix B

### WPC Analysis and Remedial Action Report

**Circuit Number** – 117054

**Division** – Gateway

**Area Served** – Maryland Heights, Missouri Area

**SAIFI Value** – 2.32

#### **Analysis Results:**

Customer interruptions experienced on this circuit in 2009 included: substation related problems. (Note: one circuit outage occurred when picking up load from an adjacent sub during a storm.)

#### **Corrective Actions:**

Special tree trimming was performed on this circuit in 2009.

DOJM Work Request number 21MT476576 was created to install a fuse switch on this circuit. This work request was completed in May, 2009.

Overhead ground line and infrared inspections are scheduled for this circuit in 2010. The repair work identified as a result of the inspection will be completed in accordance with AmerenUE's infrastructure inspection policy.

A Capacitor Inspection was performed on this circuit in 2009. Three deficiencies were identified and will be addressed.

A Recloser Inspection was performed on this circuit in 2009. One deficiency was identified and will be addressed.



## Appendix B

### **WPC Analysis and Remedial Action Report**

**Circuit Number** – 193051

**Division** – Boone Trails

**Area Served** – St. Charles, Missouri

**SAIFI Value** – 2.31

#### **Analysis Results:**

Customer interruptions experienced on this circuit in 2009 included: tree failures; an unknown cause (suspected to have been caused by a tree contact based on its location); a single-phase primary underground cable failure; and the failure of a primary single-phase tap fuse.

#### **Corrective Actions:**

This circuit was recently reclassified from a rural circuit to an urban circuit. As a result, tree trimming on this circuit is scheduled to be performed in 2010.

The single-phase underground primary cable failure that resulted in a device outage was replaced in December, 2009 under DOJM Work Request number 25SC047487.

The other device outages on the circuit caused by various equipment malfunctions will be inspected by division personnel to determine whether further remedial action is required.

An overhead visual inspection as well as an infrared inspection will be conducted on this circuit in 2010. The repair work identified as a result of the inspection will be completed in accordance with AmerenUE's infrastructure inspection policy.



## Appendix B

### **WPC Analysis and Remedial Action Report**

**Circuit Number** – 083003

**Division** – Archview

**Area Served** – Saint Louis City, Missouri

**SAIFI Value** – 2.30

#### **Analysis Results:**

Customer interruptions experienced on this circuit in 2009 included: a jumper burning open during a rain storm; two spans of downed wire during a snow storm; and public vehicle accidents.

#### **Corrective Actions:**

Tree trimming was performed on this circuit in 2009.

Repairs to the burned jumper were completed as part of the other minor problems resulting from the storm mentioned above.

As a result of the outages on this circuit, a Load Flow Analysis was performed on it by engineering personnel. This analysis did not indicate any overloads, configuration or coordination problems with this circuit.

Division engineering personnel will review this circuit to determine whether additional tap fusing or other type of fusing will improve circuit reliability.

Overhead visual and infrared inspections are scheduled on this circuit in 2010. The repair work identified as a result of the inspection will be completed in accordance with AmerenUE's infrastructure inspection policy.



## Appendix B

### **WPC Analysis and Remedial Action Report**

**Circuit Number** – 215052

**Division** – Gateway

**Area Served** – Black Jack, Missouri Area

**SAIFI Value** – 2.30

#### **Analysis Results:**

Customer interruptions experienced on this circuit in 2009 included: an excavator dig-in that hit the primary line; and a tree contact which occurred on another circuit to which this circuit was tied in an abnormal switching situation.

#### **Corrective Actions:**

Tree trimming was performed on this circuit in 2009.

The repairs resulting from the public excavator outage were completed under DOJM Work Request numbers 21MT479032 in June, 2009.

DOJM Work Request number 21MT488483, created to install a fused tap along the backbone and to remove a portion of unneeded primary, was completed in November 2009.

An overhead infrared inspection is scheduled for this circuit in 2010. The repair work identified as a result of the inspection will be completed in accordance with AmerenUE's infrastructure inspection policy.

Division engineering personnel performed a field check of this circuit in the first quarter of 2010. Those problems that were found during this field check are being addressed.



## Appendix B

### **WPC Analysis and Remedial Action Report**

**Circuit Number** – 015012

**Division** – RiverBluffs

**Area Served** – South St. Louis City, Missouri

**SAIFI Value** – 2.29

#### **Analysis Results:**

Customer interruptions experienced on this circuit in 2009 included: an underground cable fault in a manhole; and a failure on a terminal pole.

#### **Corrective Actions:**

Tree trimming was last completed on this circuit in 2007. The next tree trimming scheduled to be performed on this circuit is in 2011.

The faulted manhole cable was repaired under DOJM Work Request 21MT479173 in May, 2009.

The faulted terminal pole was repaired under DOJM Work Request 21MT494486 in December, 2009.

A circuit inspection was completed on this circuit in 2009. The circuit inspection found hardware problems that resulted in the generation of seven DOJM work requests. Six of these seven DOJM work requests have been completed. The remaining DOJM work request will be completed in April, 2010.

The circuit was patrolled by division engineering personnel in 2010. This patrol identified one cross arm which required replacement. This repair was completed under DOJM Work Request 21MT497204 in February, 2010.



## Appendix B

### **WPC Analysis and Remedial Action Report**

**Circuit Number** – 231051

**Division** – RiverBluffs

**Area Served** – South St. Louis County

**SAIFI Value** – 2.28

#### **Analysis Results:**

Customer interruptions experienced on this circuit in 2009 included: a public vehicle accident; and an animal contacting a single-phase recloser.

#### **Corrective Actions:**

Tree trimming was completed on this circuit in October 2008. The circuit is scheduled to be trimmed again in 2012.

The damage resulting from the public vehicle accident was repaired and completed in August, 2009 under the DOJM work request number 21MT485711.

Animal guards were added and lightning arresters were replaced where the animal contact occurred under the DOJM work request number 21MT493819, which was completed in January, 2010.

This circuit is scheduled for an overhead inspection in 2010. The repair work identified as a result of the inspection will be completed in accordance with AmerenUE's infrastructure inspection policy.



## Appendix B

### **WPC Analysis and Remedial Action Report**

**Circuit Number** – 615004

**Division** – SEMO

**Area Served** – Charleston, Missouri

**SAIFI Value** – 2.28

#### **Analysis Results:**

Customer interruptions experienced on this circuit in 2009 included: a tree-caused outage; and primary wire failures during a wind storm.

#### **Corrective Actions:**

Tree trimming will be performed on this circuit in 2010.

1.5 miles of this circuit were reconductored in 2009.

Overhead visual, ground line, and infrared inspections will be performed on this circuit in 2010. The repair work identified as a result of the inspection will be completed in accordance with AmerenUE's infrastructure inspection policy.



## Appendix B

### **WPC Analysis and Remedial Action Report**

**Circuit Number** – 251003

**Division** – Archview

**Area Served** – Saint Louis City, Missouri

**SAIFI Value** – 2.27

#### **Analysis Results:**

Customer interruptions experienced on this circuit in 2009 included: a PILC cable failure; and a PILC joint failure at manhole. (Note: A cable failure on the 34kV subtransmission circuit HLST-71 supplying this circuit's substation caused a momentary outage on this circuit.)

#### **Corrective Actions:**

The cables that failed on this circuit were replaced with new cable.

In addition, the 34kV subtransmission circuit HLST-71 will be reviewed by division engineering personnel to determine the cause of the momentary and cable failures.

Division engineering personnel will perform power flow analysis on this circuit, including both normal and contingency conditions, to ensure that the circuit has component rating overloads and to ensure that system voltages are within prescribed limits.



## Appendix B

### **WPC Analysis and Remedial Action Report**

**Circuit Number** – 708001

**Division** – Missouri Valley

**Area Served** – Booneville, Missouri

**SAIFI Value** – 2.27

#### **Analysis Results:**

Customer interruptions experienced on this circuit in 2009 included: public vehicle accidents; and operator errors.

#### **Corrective Actions:**

This circuit was reprioritized on the tree trimming cycle by the Vegetation Management Department and patrolled in 2009. The circuit is scheduled for tree trimming in 2010 to prevent future customer interruptions.

This circuit has undergone an overhead visual inspection and all defects such as deteriorated structures and obsolete hardware have been replaced.

An overhead visual and groundline and infrared inspection is scheduled for this circuit in 2010. During these inspections the circuit will be inspected for deficiencies such as defective poles, insulator deterioration, loose or missing line hardware, or other structural problems. The repair work identified as a result of the inspection will be completed in accordance with AmerenUE's infrastructure inspection policy.



## Appendix B

### **WPC Analysis and Remedial Report**

**Circuit Number** – 153001

**Division** – Gateway

**Area Served** – St. Louis County, Missouri Area

**SAIFI Value** – 2.27

#### **Analysis Results:**

Customer interruptions experienced on this circuit in 2009 included: two (2) public vehicles outages; and a failed disconnect switch.

#### **Corrective Actions:**

The public vehicle damage incidents were repaired under DOJM Work Requests numbers 21MT471658 and 21MT479126, which were completed in 2009.

The failed disconnect switch was repaired under DOJM Work Request number 21MT480391 was completed in 2009.

An overhead visual circuit inspection was performed on this circuit in 2009. Repairs identified as a result of this inspection included overhead guys, down guys, risers, insulators, pins, grounds, flyers, and poles. These repairs will be made under DOJM Work Requests numbers 21MT490134, 21MT490133, and 21MT490132. This work will be completed in 2010.

DOJM Work Request number 21MT501257 was created to replace a solid blade switch with 100T fuses. Also, DOJM Work Request 21MT501362 was created to replace a switch with 140T fuses. These DOJM jobs are expected to be completed in 2010.

An overhead infrared inspection is scheduled for this circuit in 2010. Any repair work identified as a result of this inspection will be addressed.

Division engineering personnel performed a field check of this circuit in the first quarter of 2010. Any problems found during this field check are being addressed.



## Appendix B

### **WPC Analysis and Remedial Action Report**

**Circuit Number** – 545051

**Division** – Meramec Valley

**Area Served** – Arnold, Missouri

**SAIFI Value** – 2.27

#### **Analysis Results:**

Customer interruptions experienced on this circuit in 2009 included: a lightning strike on a transformer during a storm; a broken pole during a wind storm; and animal and tree contacts.

#### **Corrective Actions:**

Aggressive trim trimming is scheduled for this circuit in 2010.

An overhead visual inspections and an infrared inspection will be performed on this circuit in 2010. The repair work identified as a result of the inspection will be completed in accordance with AmerenUE's infrastructure inspection policy.

Division engineering personnel will continue to review and analyze any outages on this circuit and take corrective action when warranted. In addition, division engineering personnel will perform a system protection study to see if any circuit improvements are necessary. At this time there are no other actions planned on this circuit.



## Appendix B

### **WPC Analysis and Remedial Action Report**

**Circuit Number** – 483052

**Division** – SEMO

**Area Served** – Pilot Knob, Missouri

**SAIFI Value** – 2.27

#### **Analysis Results:**

Customer interruptions experienced on this circuit in 2009 included: loss of transmission supply; public causes; and tree-caused outages.

#### **Corrective Actions:**

Six miles of this circuit were recondored under DOJM Work Request numbers 28IR031993, 28IR031994, and 28IR031995. This work was completed in September, 2009, December, 2009, and January, 2010.

DOJM Work Request number 28IR032602 was created in order to install animal guards on this circuit. This work request was completed in June, 2009.

DOJM Work Request number 28IR033264 was created in order to install animal guards to this circuit. This work request was completed in April, 2010.

DOJM Work Request number 21IR033585 was created in order to install fuses on this circuit. This work request will be completed in 2010.

A special overhead visual inspection will be performed on this circuit in 2010. This inspection will focus on animal guarding, tap fusing, and maintenance issues and any deficiencies identified will be addressed.

An overhead infrared inspection will also be performed on this circuit in 2010. The repair work identified as a result of the inspection will be completed in accordance with AmerenUE's infrastructure inspection policy.



## Appendix B

### **WPC Analysis and Remedial Action Report**

**Circuit Number** – 202001

**Division** – Archview

**Area Served** – Saint Louis City, Missouri

**SAIFI Value** – 2.27

#### **Analysis Results:**

Customer interruptions experienced on this circuit in 2009 included: a public vehicle accident during the Highway 40 reconstruction; and an Automatic Load Reduction (ALR) operation following loss of the Watson 74 substation. (Note: Circuit 202001 is designed to drop load when high load is detected on substation McCausland Unit D.)

#### **Corrective Actions:**

The overhead circuit crossing at Forest Avenue was relocated underground as part of the Highway 40 relocation work under DOJM Work Request numbers 21MT471043 and 21MT471044. This work was completed in October and November, 2009.

Division engineering personnel patrolled this circuit in 2010. As a result of this patrol, fused switches and fused hard taps on Completely Self Protected (CSP) Transformers will be installed, and several poles and transformers will be replaced. This work will be performed under DOJM Work Request 21MT498634 in 2010.

An overhead visual and infrared inspection will be performed on this circuit in 2010. The repair work identified as a result of the inspection will be completed in accordance with AmerenUE's infrastructure inspection policy.



## Appendix B

### **WPC Analysis and Remedial Action Report**

**Circuit Number** – 137057

**Division** – RiverBluffs

**Area Served** – Affton, Missouri

**SAIFI Value** – 2.26

#### **Analysis Results:**

Customer interruptions experienced on this circuit in 2009 included: the failure of fused underground lateral; and a lightning arrester failure on a backbone switch pole.

#### **Corrective Actions:**

Tree trimming was completed on this circuit in 2009.

The fuse on failed lateral was replaced under DOJM Work Request number 21MT497478 in March, 2010 as a precaution. In addition, the fuse coordination between the circuit breaker and the lateral fuse was checked and determined to be appropriate. The substation relays were field verified and tested with no problems identified.

The failed cable repair was completed under DOJM Work Request number 21MT480693 in August, 2009.

The failed lightning arrester which caused the other 2009 circuit outage was repaired under DOJM Work Request 21MT491741 in January, 2010.

Tap fusing and fuse coordination on this circuit was reviewed and proper fusing/coordination completed upon DOJM Work Request numbers 21MT496982, 21MT496978, and 21MT496983, completed in February and March, 2010.

Additional animal guarding was installed on the circuit under DOJM Work Request number 21MT497064, which was completed in February, 2010.

Division engineering personnel inspected the unfused backbone of this circuit in February, 2010 and found no problems.

An overhead visual and infrared inspection will be performed on this circuit in 2010. The repair work identified as a result of the inspection will be completed in accordance with AmerenUE's infrastructure inspection policy.



## Appendix B

### **WPC Analysis and Remedial Action Report**

**Circuit Number** – 147053

**Division** – Gateway

**Area Served** – Maryland Heights, Missouri Area

**SAIFI Value** – 2.25

#### **Analysis Results:**

Customer interruptions experienced on this circuit in 2009 included: an underground malfunction; and a circuit outage of unknown cause.

#### **Corrective Actions:**

Tree trimming was last performed on this circuit in 2007.

Power-On project 25-7-1940-1567 replaced an overhead portion of this circuit with 1,830 ft of new cable. This project was completed in January, 2009.

An overhead ground line inspection was performed in 2009 and three deficiencies were identified. These deficiencies will be addressed.

An underground inspection was performed on this circuit in 2009 and six deficiencies were identified. The work that is being done to address these issues is done under DOJM Work Request numbers 21MT495534, 21MT489010, 21MT495533, and 21MT495535. This work will be completed in 2010.

A Capacitor Inspection was performed on this circuit in 2009. One deficiency was identified and will be addressed.

An overhead infrared inspection is scheduled for this circuit in 2010. The repair work identified as a result of the inspection will be completed in accordance with AmerenUE's infrastructure inspection policy.



## Appendix B

### **WPC Analysis and Remedial Action Report**

**Circuit Number** – 053052

**Division** – RiverBluffs

**Area Served** – Crestwood, Missouri

**SAIFI Value** – 2.24

#### **Analysis Results:**

Customer interruptions experienced on this circuit in 2009 included: an underground cable joint failure; and a public vehicle accident.

#### **Corrective Actions:**

Tree trimming was completed on this circuit in 2009.

The outage caused by the public vehicle accident was not considered an avoidable event. All damage was repaired under DOJM Work Request Number 21MT485023, which was completed in July, 2009.

The underground cable joint failure was repaired at the time of the failure under DOJM Work Request Number 21MT476767.

An infrared inspection was performed on this circuit after the underground failure; however, no further problems were identified. Tap fusing on this circuit has been reviewed and determined to be appropriate.

Division engineering personnel inspected the unfused backbone of this circuit in February, 2010 and no issues were identified.

An overhead visual and infrared inspection will be performed on the circuit in 2010. The repair work identified as a result of the inspection will be completed in accordance with AmerenUE's infrastructure inspection policy.



## Appendix B

### **WPC Analysis and Remedial Action Report**

**Circuit Number** – 208004

**Division** – Archview

**Area Served** – Moline Acres, Missouri

**SAIFI Value** – 2.23

#### **Analysis Results:**

Customer interruptions experienced on this circuit in 2009 included: broken cross arms on the 34kV overbuild fell into the circuit during heavy rain, tripping both this circuit and the associated subtransmission circuit; and unknown cause, one occurring during a thunder storm. (There was no indication of lightning strikes in the area.)

#### **Corrective Actions:**

Tree trimming was last completed on this circuit in 2007 and is on cycle with respect to tree trimming frequency.

DOJM Work Request number 21MT477006 was completed in April, 2009 as part of the repairs of the broken cross arms following the outage of this circuit.

A circuit inspection was performed on the circuit in 2009. DOJM Work Request number 21MT480798 and 21MT480799 were initiated to correct problems identified with guy wires, braces, cross arms, and lightning arresters. Both of these work requests are scheduled to be completed in 2010.

Load flow analyses were performed on this circuit, but did not indicate any overloads, identify any configuration, or coordination problems. The circuit will be reviewed to determine whether additional tap fusing or other fuses are necessary to improve circuit reliability.

An overhead visual and infrared inspection is scheduled for this circuit in 2010. The repair work identified as a result of the inspection will be completed in accordance with AmerenUE's infrastructure inspection policy.



## Appendix B

### **WPC Analysis and Remedial Action Report**

**Circuit Number** – 678004

**Division** – SEMO

**Area Served** – East Prairie, Missouri

**SAIFI Value** – 2.22

#### **Analysis Results:**

Customer interruptions experienced on this circuit in 2009 included: lightning strikes on the substation; and loss of transmission.

#### **Corrective Actions:**

A mid-cycle tree patrol will be performed on this circuit in 2010.

DOJM Work Request number 2TSE088555 was created in order to replace three poles on the circuit. This work request was completed in October, 2009.

Overhead visual and infrared inspections will be performed on this circuit in 2010. The repair work identified as a result of the inspection will be completed in accordance with AmerenUE's infrastructure inspection policy.



## Appendix B

### **WPC Analysis and Remedial Action Report**

**Circuit Number** – 673052

**Division** – Boone Trails

**Area Served** – Moscow Mills, Missouri

**SAIFI Value** – 2.22

#### **Analysis Results:**

Customer interruptions experienced on this circuit in 2009 included: trees; animal intrusions; and overhead failures.

#### **Corrective Actions:**

A section of this circuit was reworked in 2009 as part of a road widening at Highway U and Highway 61 worked under DOJM Work Request number 2WWZ128485, which was completed in June, 2009. (This was an area that caused a circuit outage before it was reworked.)

A second portion of the circuit was relocated from private right-of-way to an area along roadways under DOJM Work Request numbers 2WWZ126600, 2WWZ126601, 2WWZ126603, and 2WWZ126604, which were completed December, 2009.

There are a few more areas of this circuit to be reviewed by division engineering personnel for possible upgrade work. Upon review, projects will be submitted to the budget for potential approval.



## Appendix B

### WPC Analysis and Remedial Action Report

**Circuit Number** – 140005

**Division** – Gateway

**Area Served** – Olivette, Missouri Area

**SAIFI Value** – 2.21

#### **Analysis Results:**

Customer interruptions experienced on this circuit in 2009 included: a tree problem caused ground wire contact on the substation bus resulting in a tripped 34KV subtransmission line during a storm; and a broken cross arm during windy conditions.

#### **Corrective Actions:**

An overhead ground line circuit inspection was performed in 2009. The results of this inspection identified repairs needed for down guys, overhead guys, v-braces, grounds, insulators, risers, crossarms, spacers, pins, loose transformers, and poles. This repair work is being performed under DOJM Work Request numbers 21MT487640, 21MT487639, 21MT487638, 21MT487638, 21MT487629, 21MT487637, 21MT487636, 21MT487635, 21MT487634, 21MT487633, 21MT487632, 21MT487631, 21MT487630, 21MT487628, 21MT487627, 21MT487626, 21MT487625, and 21MT487624. The majority of these work requests were completed in 2009. The remainder will be completed in 2010.

An overhead infrared inspection is scheduled for this circuit in 2010. The repair work identified as a result of the inspection will be completed in accordance with AmerenUE's infrastructure inspection policy.

Division engineering personnel performed a field check of this circuit in the first quarter of 2010. DOJM Work Request number 21MT501611 was created to address various maintenance issues resulting from this field check. This work is expected to be completed in 2010.



## Appendix B

### **WPC Analysis and Remedial Action Report**

**Circuit Number** – 817055

**Division** – SEMO

**Area Served** – Anniston, Missouri

**SAIFI Value** – 2.19

#### **Analysis Results:**

Customer interruptions experienced on this circuit in 2009 included: a failed bushing in the substation regulator.

#### **Corrective Actions:**

Tree trimming will be performed on this circuit in 2010.

DOJM Work Request number 2TSE089087 was created in order to replace a pole and add animal guards to this circuit. This work request was completed in September, 2009.

A special overhead visual inspection will be performed on this circuit in 2010. This inspection will focus on animal guarding, tap fusing, and maintenance issues and any deficiencies identified will be addressed.

An overhead infrared inspection will also be performed on this circuit in 2010. The repair work identified as a result of the inspection will be completed in accordance with AmerenUE's infrastructure inspection policy.



## Appendix B

### **WPC Analysis and Remedial Action Report**

**Circuit Number** – 544055

**Division** – Boone Trials

**Area Served** – St. Charles, Missouri

**SAIFI Value** – 2.19

#### **Analysis Results:**

Customer interruptions experienced on this circuit in 2009 included: two (2) circuit outages as the result of broken tree branches contacting overhead lines; fuse failures on single-phase overhead taps caused by tree contact. (Note: This circuit runs off road through wooded areas and behind residential areas. As a result, the overwhelming majority of customer interruptions experienced on this circuit in 2009 were tree related.)

#### **Corrective Actions:**

As a result of the tree-caused CI experienced in 2009, hot-spot tree trimming was performed on the circuit near where the tree contacts occurred. Tree trimming was last completed on this circuit in 2007 and is next scheduled for tree trimming in 2011. However, this circuit will be patrolled in 2010 and any additional spot tree trimming identified will be performed under DOJM Work Request number 25SC048559.

An overhead visual inspection, a detailed underground inspection, and an infrared inspection will be performed on this circuit in 2010. The repair work identified as a result of the inspection will be completed in accordance with AmerenUE's infrastructure inspection policy.

Division personnel will evaluate the feasibility of installing 'smart' reclosers midway on the circuit to help isolate some of the tree related circuit outages while still maintaining circuit capacity.

Additional tap fusing will be installed on the single-phase overhead taps affected by tree outages to help isolate these sections of the circuit.



## Appendix B

### **WPC Analysis and Remedial Action Report**

**Circuit Number** – 623001

**Division** – SEMO

**Area Served** – Charleston, Missouri

**SAIFI Value** – 2.18

#### **Analysis Results:**

Customer interruptions experienced on this circuit in 2009 included: primary wire failures during storms; and overhead malfunctions.

#### **Corrective Actions:**

Overhead visual, ground line, and infrared inspections will be performed on this circuit in 2010. The repair work identified as a result of the inspection will be completed in accordance with AmerenUE's infrastructure inspection policy.



## Appendix B

### WPC Analysis and Remedial Action Report

**Circuit Number** – 260057

**Division** – Gateway

**Area Served** – Black Jack and St. Louis County, Missouri Area

**SAIFI Value** – 2.16

#### **Analysis Results:**

Customer interruptions experienced on this circuit in 2009 included: two (2) circuit outages due to tree problems; two (2) pin insulator failures which allowed the phases to contact each other during windy conditions; animal contact with a terminal pole; and primary wire failure during windy conditions.

#### **Corrective Actions:**

Tree trimming was last performed on this circuit in 2008.

DOJM Work Request number 21MT479794 was created in order to repair a burned switch resulting from a tree problem. This work request was completed in June, 2009.

DOJM Work Request number 21MT490344 was created in order to install animal guards on this circuit. This work request was completed in November, 2009.

DOJM Work Request number 21MT499358 was created in order to replace a broken pole top pin. This work request was completed in March, 2010.

A large portion of three-phase backbone runs through a forested area along private property on this circuit. DOJM Work Request number 21MT464709 was created in order to convert a single-phase section of this circuit to three-phase line. This work request was completed in January, 2009. This will allow the circuit to be rerouted along the road. In addition, DOJM Work Request number 21MT498927 was created in order to remove the three-phase section of the circuit through the forested area. This work request is expected to be completed in 2010. When completed, a significant amount of the outage exposure on this circuit will be eliminated.

Overhead visual and infrared inspections will be performed on this circuit in 2010. The repair work identified as a result of the inspection will be completed in accordance with AmerenUE's infrastructure inspection policy.

Division engineering personnel performed a field check of this circuit in the first quarter of 2010. Any problems found during this field check are being addressed.



## Appendix B

### **WPC Analysis and Remedial Action Report**

**Circuit Number** – 729053

**Division** – Boone Trails

**Area Served** – Cottleville, Missouri

**SAIFI Value** – 2.16

#### **Analysis Results:**

Customer interruptions experienced on this circuit in 2009 included: substation equipment malfunction due to incorrect relay settings, unknown causes (suspected to be caused by incorrect substation relay settings); and tree contact.

#### **Corrective Actions:**

The area where the tree-caused outage occurred underwent spot tree trimming by Vegetation Management. In addition to this tree trimming, the entire circuit is scheduled for tree trimming in 2010.

The portion of this circuit where tree-caused outages have occurred in the past is being evaluated to improve its reliability, including a combination of overhead and underground relocations.



## Appendix B

### WPC Analysis and Remedial Action Report

**Circuit Number** – 274006

**Division** – Gateway

**Area Served** – St. John, Missouri Area

**SAIFI Value** – 2.14

#### **Analysis Results:**

Customer interruptions experienced on this circuit in 2009 included: public tree trimmers and subsequent operator error on restoration; broken wires during windy conditions; and a broken pole caused by a tree.

#### **Corrective Actions:**

Tree trimming was performed on this circuit in 2009.

DOJM Work Request number 21MT484070 was created in order to repair the damage caused by the public tree trimmers. This work request was completed in July, 2009.

DOJM Work Request number 21MT485032 was created in order to repair the broken pole. This work request was completed in August, 2009.

An overhead visual and infrared inspection will be performed on this circuit in 2010. The repair work identified as a result of the inspection will be completed in accordance with AmerenUE's infrastructure inspection policy.

Division engineering personnel performed a field check of this circuit in the first quarter of 2010. DOJM Work Request number 21MT501619 was created to address various maintenance issues. This work is expected to be completed in 2010.



## Appendix B

### **WPC Analysis and Remedial Action Report**

**Circuit Number** – 453055

**Division** – SEMO

**Area Served** – Caruthersville, Missouri

**SAIFI Value** – 2.14

#### **Analysis Results:**

Customer interruptions experienced on this circuit in 2009 included: animal intrusion into the substation; and a primary failure during a storm.

#### **Corrective Actions:**

Tree trimming was last performed on this circuit in 2009.

Ten miles of the 34kV and associated under-build on this circuit will be reconductored and a new 34kV loop will be constructed on this circuit.

A special overhead visual inspection will be performed on this circuit in 2010. This inspection will focus on animal guarding, tap fusing, and maintenance issues and any deficiencies identified will be addressed.

An overhead infrared inspection will also be performed on this circuit in 2010. The repair work identified as a result of the inspection will be completed in accordance with AmerenUE's infrastructure inspection policy.



## Appendix B

### **WPC Analysis and Remedial Action Report**

**Circuit Number** – 686052

**Division** – Central Ozarks

**Area Served** – Eldon, Missouri

**SAIFI Value** – 2.13

#### **Analysis Results:**

This circuit experienced one outage in 2009. This outage was caused by a broken primary wire on the circuit. In November 2009, work was completed on the new 676053 circuit and 327 customers were transferred from the existing circuit 686052 to the new circuit. This transfer resulted in a reduction in the number of customers on this circuit from 624 to 297. This artificially inflated the SAIFI calculation for this circuit.

#### **Corrective Actions:**

Tree trimming was last completed on this circuit in 2009.

Due to the actual low incidence of outages for this circuit, no additional work is planned for this circuit in 2010.



## Appendix B

### WPC Analysis and Remedial Action Report

**Circuit Number** – 506055

**Division** – Meramec Valley

**Area Served** – Washington, Missouri

**SAIFI Value** – 2.13

#### **Analysis Results:**

Customer interruptions experienced on this circuit in 2009 included: insulator failures on unprotected backbone taps; line failures as a result of storms; tree-caused outages during storms; and substation equipment failure.

#### **Corrective Actions:**

An overhead visual and infrared inspection was performed on this circuit in 2010. The following DOJM work request numbers were created to repair the problems identified as a result of these inspections:

DOJM Work Request number 23FR045943 was created in order to replace existing crossarms. This work request was completed in December, 2009.

DOJM Work Request number 23FR047467 was created in order to replace lightning arresters, is in progress.

DOJM Work Request number 23FR047471 was created in order to install animal guarding on a portion of the circuit. This work request was completed in February, 2010.

DOJM Work Request number 23FR047472 was created in order to install a tap fuse on a portion of the circuit. This work request was completed in February, 2010.

DOJM Work Request number 23FR047975 was created in order to replace circuit hardware. This work request was completed in February, 2010.



## Appendix B

### **WPC Analysis and Remedial Action Report**

**Circuit Number** – 479052

**Division** – SEMO

**Area Served** – Cadet, Missouri

**SAIFI Value** – 2.13

#### **Analysis Results:**

Customer interruptions experienced on this circuit in 2009 included: a public vehicle accident; and a tree-caused outage.

#### **Corrective Actions:**

Tree trimming will be performed on this circuit in 2010.

DOJM Work Request number 28IR031861 was created in order to install animal guards to this circuit. This work request was completed in February, 2009

DOJM Work Request number 28IR033586 was created in order to install fuses on this circuit. This work request is expected to be completed in 2010.

A special overhead visual inspection will be performed on this circuit in 2010. This inspection will focus on animal guarding, tap fusing, and maintenance issues and any deficiencies identified will be addressed.

An overhead infrared inspection will also be performed on this circuit in 2010. The repair work identified as a result of the inspection will be completed in accordance with AmerenUE's infrastructure inspection policy.



## Appendix B

### WPC Analysis and Remedial Action Report

**Circuit Number** – 167054

**Division** – Gateway

**Area Served** – Bellefontaine Neighbors, Missouri Area

**SAIFI Value** – 2.12

#### **Analysis Results:**

Customer interruptions experienced on this circuit in 2009 included: public vehicle accidents; two (2) tree-caused outages; and recloser failures during rainy conditions.

#### **Corrective Actions:**

Tree trimming was performed on this circuit in 2009.

DOJM Work Request number 21MT473728, which remove a portion of single-phase wire which had a significant amount of tree exposure, was completed in May, 2009. Single-phase primary was extended to supply the customers from a different direction, and fuses were installed to protect the backbone.

DOJM Work Request number 21MT474449, which replaced a solid blade switch with fuses and resized two other fuses to ensure correct coordination, was completed in August, 2009

DOJM Work Request numbers 21MT501207, 21MT501206, 21MT501204, 21MT501202, 21MT501201, 21MT501205, and 21MT501203, which were created to install animal guard, move transformers, replace lightning arrestors, install fuses, replace broken pins, and replace terminations, have been completed or will be completed in 2010.

An overhead infrared inspection is scheduled for this circuit in 2010. Any repair work identified as a result of this inspection will be addressed.

Division engineering personnel performed a field check of this circuit in the first quarter of 2010. Problems found during this field check are being addressed.



## Appendix B

### **WPC Analysis and Remedial Action Report**

**Circuit Number** – 289055

**Division** – RiverBluffs

**Area Served** – Wildwood, Missouri

**SAIFI Value** – 2.12

#### **Analysis Results:**

Customer interruptions experienced on this circuit in 2009 included: tree failure; a relay switching error on the Babler-75 subtransmission circuit; and animal contact between a jumper and a wet cross arm.

#### **Corrective Actions:**

Tree trimming was last completed on this circuit in 2007. The next tree trimming for this circuit is scheduled to take place in 2011.

Detailed URD and overhead visual inspections were completed on this circuit in 2009. The repairs identified as a result of these inspections will be completed in 2010.

Overhead visual and infrared inspections will be performed on this circuit in 2010. The repair work identified as a result of the inspection will be completed in accordance with AmerenUE's infrastructure inspection policy.



## Appendix B

### **WPC Analysis and Remedial Action Report**

**Circuit Number** – 295051

**Division** – RiverBluffs

**Area Served** – Wildwood, Missouri

**SAIFI Value** – 2.12

#### **Analysis Results:**

Customer interruptions experienced on this circuit in 2009 included: a circuit outage due to tree failure which brought down two spans of single-phase primary even though the single-phase portion of the circuit was protected by a fuse; and a cable failure during an abnormal switch configuration to a tie feeder in support of a MODOT bridge replacement project.

#### **Corrective Actions:**

Tree trimming was last completed on this circuit in 2008. The next tree trimming for this circuit is scheduled to be performed in 2014.

A detailed URD inspection, as well as an overhead visual inspection, was completed on this circuit in 2009. The repairs identified as a result of these inspections will be completed in 2010.

This circuit is scheduled to have both visual and infrared inspections in 2010. The repair work identified as a result of the inspection will be completed in accordance with AmerenUE's infrastructure inspection policy.



## Appendix B

### **WPC Analysis and Remedial Action Report**

**Circuit Number** – 678007

**Division** – SEMO

**Area Served** – East Prairie, Missouri

**SAIFI Value** – 2.12

#### **Analysis Results:**

Customer interruptions experienced on this circuit in 2009 included: substation outages caused by the loss of transmission supply; and breaker trips during a storm.

#### **Corrective Actions:**

Tree trimming will be performed on this circuit in 2010.

Overhead visual and infrared inspections will be performed on this circuit in 2010. The repair work identified as a result of the inspection will be completed in accordance with AmerenUE's infrastructure inspection policy.