

Illinois Commerce Commission  
Assessment of AmerenIP's  
Reliability Report and Reliability Performance  
For Calendar Year 2009

Pursuant to 83 Illinois Administrative Code 411.140

July 12, 2011

**OFFICIAL FILE**

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# 1. Executive Summary

Beginning in the year 1999 and at least every three years thereafter, 83 Illinois Administrative Code Part 411.140(a) requires the Commission to assess the annual electric reliability report of each jurisdictional entity and evaluate its reliability performance. This report represents Staff's assessment of AmerenIP's 2009 annual electric reliability report and Staff's evaluation of AmerenIP's reliability performance during 2009.

Pursuant to Section 16-125 of the Illinois Public Utilities Act and the Commission's electric reliability rules in 83 Illinois Administrative Code, Part 411, Illinois Power Company d/b/a AmerenIP (AmerenIP) filed its annual electric reliability report for calendar year 2009 on May 28, 2010. Staff noted that AmerenIP's annual electric reliability report does not comply with 83 Ill Adm. Code 411.120 (b)(3) in two areas. AmerenIP agreed with Staff's findings and filed a revised version of its annual electric reliability report for calendar year 2009 on July 9, 2010.

In 2009, AmerenIP's System Average Interruption Frequency Index ("SAIFI") was 0.99 interruptions, about 43% below the average 1.74 SAIFI reported by the other five utilities. AmerenIP's worst circuit SAIFI was 3.44 in 2009, the second lowest of six reporting utilities. AmerenIP's Customer Average Interruption Duration Index ("CAIDI") was 187 minutes, the third highest of six reporting utilities and 3.5 minutes below the average 190.5 minutes CAIDI reported by the other five utilities. However, a 462 minutes CAIDI at one of AmerenIP's sister utilities (AmerenCIPS) caused the 190.5 minute average for five utilities to be significantly higher than it would otherwise have been. In fact, the other three Illinois electric utilities significantly outperformed the three Ameren utilities by recording much lower CAIDI numbers. AmerenIP's worst circuit CAIDI was 1,661 minutes, the third lowest of six reporting utilities. AmerenIP's Customer Average Interruption Frequency Index ("CAIFI") was 1.6, the lowest of six reporting utilities.

AmerenIP's reliability indices for 2009 compared to 2008 indicate that AmerenIP customers experienced fewer (SAIFI) and shorter (CAIDI) interruptions during 2009. In addition, for customers who experienced interruptions, the AmerenIP CAIFI indicates that ~~those~~ customers experienced fewer interruptions in 2009 than in 2008.

AmerenIP reported that 739 customers exceeded the electric service reliability targets in 2009. Of the 739 customers, AmerenIP reported nine customers (1.2%) experienced more than six interruptions and 651 customers (88%) experienced more than eighteen hours of total interruption duration in each of the last three consecutive years. In

addition, 73 customers (10%) experienced more than eighteen hours of total interruption duration in each of the last four consecutive years, and 6 customers (0.8%) experienced more than eighteen hours of total interruption duration in each of the last five consecutive years. The number of customers who exceeded the electric service reliability targets went down by 13 % from 850 in 2008 to 739 in 2009. The number of customers who exceeded reliability targets in 2009 is much lower than the 1,539 AmerenIP customers who exceeded reliability targets in 2005 and the 5,356 AmerenIP customers who exceeded reliability targets in 2006. On the other hand, the number of customers who exceeded reliability targets in 2009 is still much higher than the 397 AmerenIP customers who exceeded reliability targets in 2007, the 369 AmerenIP customers who exceeded reliability targets in 2004, and the 160 AmerenIP customers who exceeded reliability targets in 2003.

In 2009 AmerenIP had the second highest number of customers who exceeded the reliability targets (739 customers) compared to AmerenCIPS (355 customers), AmerenCILCO (588 customers), Mt. Carmel (three customers), MidAmerican (2,143 customers), and ComEd (182 customers). AmerenIP's 2009 revised annual electric reliability report contains a supplemental report that lists a unique identifying number for every customer who exceeded frequency or duration targets, number of consecutive years each frequency or duration target was exceeded, the cause of the interruption, the actions taken, and the plan to correct the interruption cause(s). AmerenIP reported that storms caused most customer interruptions during 2009. Actions taken and planned by AmerenIP to correct the cause of interruptions seem reasonable.

Compared to 2008 causes of interruptions, Staff noted increases in interruptions related to jurisdictional entity / contractor personnel – errors ("jurisdictional"), transmission, and weather in 2009. Staff encourages AmerenIP to work hard to reduce customer interruptions.

Compared to 2009 capital expenditures, AmerenIP reported that it plans to decrease its distribution and transmission capital expenditures for the next four years. On the other hand, AmerenIP reported that it plans to increase its distribution and transmission O&M for the next four years. AmerenIP planned to decrease its distribution tree trimming expenditures in the years of 2010 through 2012 compared to its actual distribution tree trimming expenditures in 2009. However, AmerenIP's 2008 budgeted distribution tree trimming expenditures for the year 2009 was less than the actual distribution tree trimming expenditures for that year. Finally, AmerenIP reduced its 2009 budgeted tree trimming expenditures for years 2010 and 2011 compared to its 2008 budgeted tree trimming expenditures for those years. In its revised 2009 reliability report, AmerenIP indicated that, due to the reduction in its projected revenue because of the ICC's Final

Order in Ameren Illinois Utilities' recent rate case, Ameren decided to reduce its total spending level as indicated above. In addition, AmerenIP reduced its budgeted tree trimming expenditures for years 2010 and 2011. Yet, AmerenIP claims that it will continue to provide safe and reliable service to meet regulatory requirements.

During 2009 AmerenIP had used Infrared Aerial Patrols to determine which pieces of sub-transmission equipment are currently operating at higher-than-desired temperatures, so mitigation efforts can be planned and scheduled to repair or replace equipment before it fails. Circuits will no longer be inspected from the air starting in 2010, but inspectors will walk pole to pole to test for hot spots. Staff notes that this change, from an inspection from a moving aircraft, to an inspection by people on the ground, is a significant improvement in AmerenIP's practices as long as inspection frequency does not change.

AmerenIP moved its visual inspection cycle for sub-transmission circuits from a two-year to a five-year repeating cycle. In response to a Staff data request, AmerenIP promised to perform the sub-transmission circuit inspection on a four-year repeating cycle as suggested by Liberty recommendation VI 3(B) and provided in the June 10, 2010 Liberty quarterly report to the Commission<sup>1</sup>. AmerenIP also moved its visual circuit inspection cycle from four years to five years for the initial phase only due to unexpectedly high numbers of violations.

During 2009, Staff inspected five circuits that AmerenIP listed among its worst performing circuits in its 2009 revised annual reliability report. AmerenIP provided circuit maps to aid Staff during circuit inspections. Some of those maps were incomplete and others were inaccurate. Staff noted and reported reliability problems when inspecting those circuits, and reported its findings to AmerenIP. AmerenIP's response indicated that AmerenIP had already corrected some of those findings, and is scheduled to correct others. Staff will follow up with AmerenIP to make sure that it corrected all Staff findings.

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<sup>1</sup> Liberty Consulting Group was hired by the Commission in 2007 to investigate Ameren's preparedness and restoration of its plans and facilities after storms in the summer and early winter of 2006 caused lengthy service interruptions.

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## **2. Introduction**

Beginning in the year 1999 and at least every three years thereafter, 83 Illinois Administrative Code Part 411.140(a) requires the Commission to assess the annual electric reliability report of each jurisdictional entity and evaluate its reliability performance. Code Part 411.140(a)(2) states that the Commission evaluation shall:

- A) Assess the jurisdictional entity's historical performance relative to established reliability targets.
- B) Identify trends in the jurisdictional entity's reliability performance.
- C) Evaluate the jurisdictional entity's plan to maintain or improve reliability.
- D) Include specific identification, assessment, and recommendations pertaining to any potential reliability problems and risks that the Commission has identified because of its evaluation.
- E) Include a review of the jurisdictional entity's implementation of its plan for the previous reporting period.

This report provides Staff's assessment of 2009 revised annual reliability report filed by Illinois Power Company d/b/a AmerenIP ("AmerenIP") and Staff's evaluation of AmerenIP's reliability performance for calendar year 2009. This report is organized to cover all of the above listed requirements.

## **3. AmerenIP's 2009 Customer Base and Service Territory**

In 2009, AmerenIP provided electric service to 625,143 customers in Illinois. AmerenIP's electric service territory covers 15,000 square miles. Most of AmerenIP's customer base is located in rural areas and small towns throughout Illinois. Major communities served by AmerenIP include Decatur, Belleville, Bloomington-Normal, Champaign-Urbana, Centralia, Galesburg, Granite City, Hillsboro, Jacksonville, LaSalle, Maryville, and Mt. Vernon.

## **4. AmerenIP's Electrical Distribution System**

AmerenIP's electric distribution system consists of approximately 87% overhead conductor and 13% underground conductor. At the end of 2009, AmerenIP's distribution system included 926 circuits with approximately 63% 12 KV circuits and approximately 37% 4 KV circuits.

Subsection 411.120(b)(3)(G) requires the utilities to report on the age of its distribution facilities. AmerenIP estimates that the average age of its distribution equipment range from 12.2 years (for underground conductor and devices) to 26.3 years (for structures and improvements). AmerenIP estimates an average age of 15.4 years for poles, towers, and fixtures, 18.7 years for line transformers, 16.8 years for overhead conductors and devices, 17.0 years for underground conduit, 17.2 years for services overhead, 17.6 years for station equipment, and 16.0 years for underground services. The remaining average distribution equipment lives (remaining accounting lives) range from 10.8 years (for underground conductor and devices) to 34.4 years (for substation equipment). AmerenIP estimates an average remaining life of 15.6 years for poles and fixtures, 24.3 years for line transformers, 33.7 years for structures and improvements, 18.2 years for overhead conductor and devices, 16.0 years for conduit, 13.8 years for services overhead, and 15.0 years for underground services.

See Tables 22 and 28 (pages 45 and 48) in AmerenIP's 2009 revised annual reliability report for more details.

## **5. Assessment of AmerenIP's 2009 Revised Reliability Report**

Section 16-125 of the Public Utilities Act and the Commission's electric reliability rules in 83 Illinois Administrative Code, 411.120(b), require each non-exempt jurisdictional entity to file an annual electric reliability report for the previous calendar year, by June 1 of the current year. AmerenIP filed its annual electric reliability report for 2009 on May 28, 2010. Staff noted that AmerenIP's annual electric reliability report did not comply with 83 Ill Adm. Code 411.120 (b)(3) in two areas. AmerenIP agreed with Staff's findings and filed a revised version of its annual electric reliability report for calendar year 2009 on July 9, 2010. AmerenIP's revised 2009 annual electric reliability report contains the information required by Code Part 411.120(b)(3).

## 6. AmerenIP's Historical Performance Relative to Established Reliability Targets

Code Part 411.140(b)(4)(A-C) requires each jurisdictional entity ("utility") to strive to provide electric service to its customers that complies with the targets listed in table 1. These targets state explicitly the maximum number of controllable interruptions and the maximum controllable interruption duration in each of the last three consecutive years that a utility must strive not to exceed on a per customer basis. Beginning in June 10, 2001, Code Part 411.120(b)(3)(L) requires each utility to provide a list of every customer who experienced interruptions in excess of the service reliability targets, identified by a unique number assigned by the utility and not the customer's name or account number. In addition, the list should include the number of interruptions and interruption duration experienced by each customer in each of the three preceding years, and the number of consecutive years in which each customer has experienced interruptions in excess of the service reliability targets.

In April 2004, AmerenIP, along with all other regulated Illinois electric utilities, agreed to report on all interruptions (controllable and uncontrollable) as defined in Code Part 411.20 in relation to the service reliability targets for the reporting periods of 2003 through 2007. Also, AmerenIP, along with all other regulated Illinois electric utilities, agreed to include the specific actions, if any, that the utility plans or has taken to address the customer reliability concerns. In January 2008, the electric utilities agreed to extend the agreement to 2012. The customer service reliability targets are listed in table 1.

**Table 1**  
**CUSTOMER SERVICE RELIABILITY TARGETS**

Immediate Primary Source of Service Operation Voltage	Maximum Number of Interruptions in Each of The Last Three Consecutive Years (Per Customer)	Maximum Hours of Total Interruptions in Each of The Last Three Consecutive Years (Per Customer)
69kV or Above	3	9
Between 15kV & 69kV	4	12
15kV or Below	6	18

According to AmerenIP's 2009 revised annual reliability report, the number of customers that exceeded the service reliability targets in each of the three preceding years is listed in table 2.

**Table 2**  
**NUMBER OF CUSTOMERS WHO EXCEEDED THE SERVICE RELIABILITY TARGETS AS REPORTED IN AmerenIP 2009-REVISED RELIABILITY REPORT**

Immediate Primary Source of Service Operation Voltage	Number of Customers Who had Interruptions in Each of The Last Three Consecutive Years Greater than The Service Reliability Targets	Number of Customers Who had Interruption Duration in Each of The Last Three Consecutive Years Greater than The Service Reliability Targets
69kV or Above	0	0
Between 15kV & 69kV	0	0
15kV or Below	9	730

Table 3 is a numerical summary of AmerenIP's 2009 reliability target violations, sorted by the number of consecutive years, as reported in AmerenIP's supplemental report.

**Table 3**  
**NUMERICAL SUMMARY OF AmerenIP'S 2009 SUPPLEMENTAL REPORT (AmerenIP CUSTOMERS WHO EXCEEDED RELIABILITY TARGETS)**

Consecutive Years	AmerenIP Customers Who Exceeded Frequency Targets	AmerenIP Customers Who Exceeded Duration Targets
3	9	651
4	0	73
5	0	6
6	0	0

AmerenIP reported that 739 of its customers exceeded the reliability targets in 2009. Of the 739 total customers, AmerenIP reported that nine customers experienced more than six interruptions and 651 customers experienced more than eighteen hours of total interruption duration in each of the last three consecutive years. In addition, 73 customers experienced more than eighteen hours of total interruption duration in each of the last four consecutive years, and six customers experienced more than eighteen hours of total interruption duration in each of the last five consecutive years.

Table 4 shows a year-by-year comparison of the total numbers of AmerenIP customers who exceeded the service reliability targets.

**Table 4**  
**TOTAL AmerenIP CUSTOMERS EXCEEDING RELIABILITY TARGETS BY YEAR**

Year	Number of Customers	Prior Year Number of Customers as a % of 2009 Customers Exceeding Targets
2009	739	100%
2008	850	115%
2007	397	54%
2006	5,356	725%
2005	1,539	208%
2004	369	50%
2003	160	22%

The comparison between the number of customers who exceeded the service reliability targets in the past seven years shows:

- The number of customers who exceeded the service reliability targets went down by 13% from 850 in 2008 to 739 in 2009.
- The number of customers who exceeded the service reliability targets is still much higher than the 397 customers who exceeded the reliability targets in 2007, the 369 customers who exceeded those targets in 2004, and the 160 customers who exceeded those targets in 2003.

The decrease in the number of customers who exceeded the service reliability targets during 2009 compared to 2008 is a good sign; AmerenIP should continue to strive to reduce this number.

In 2009, AmerenIP had the second highest number of customers who exceeded the reliability targets (739 customers) compared to AmerenCIPS (355 customers), AmerenCILCO (588 customers), Mt. Carmel (three customers), MidAmerican (2,143 customers), and ComEd (182 customers).

AmerenIP's 2009 revised reliability report contains a supplemental report that includes a unique number for every customer who exceeded frequency or duration targets, number of consecutive years, the cause of the interruption, the action taken, and the action planned. AmerenIP reported that storms caused most of the customer interruptions during 2009. The actions taken and planned by AmerenIP seem reasonable.

## 7. Analysis of AmerenIP's Year 2009 Reliability Performance

### A. Statistical Reliability Data

SAIFI<sup>2</sup>: System Average Interruption Frequency Index = Total # of Customer Interruptions / Total # of Customers Served

Table 5 shows 2009 SAIFI for each of the reporting Illinois utilities

**Table 5 - 2009 SAIFI for Illinois Utilities**

Utility	SAIFI 2009
MidAmerican	2.51
Mt.Carmel	2.32
AmerenCIPS	1.51
AmerenCILCO	1.37
ComEd	1.01
<b>AmerenIP</b>	<b>.99</b>

In 2009, AmerenIP's SAIFI was 0.99, about 43% below the average SAIFI (1.74) reported by the other five utilities and the lowest of six reporting utilities.

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<sup>2</sup> SAIFI indicates the average interruption frequency for all customers (customers who had and customers who had not interruptions) on a utility electric system during a specific year.

CAIDI<sup>3</sup>: Customer Average Interruption Duration Index = Sum of all Interruption Durations / Total # of Customer Interruptions.

Table 6 shows 2009 CAIDI for each of the reporting Illinois utilities.

**Table 6 - 2009 CAIDI for Illinois Utilities**

Utility	CAIDI 2009
AmerenCIPS	462
AmerenCILCO	197
<b>AmerenIP</b>	<b>187</b>
ComEd	112
MidAmerican	105.5
Mt. Carmel	75.9

In 2009, AmerenIP's CAIDI was 187 minutes, the third highest of six reporting utilities and 3.5 minutes below the average CAIDI (190.5) reported by the other five utilities.

CAIFI<sup>4</sup>: Customer Average Interruption Frequency Index = Total # of Customer Interruptions / Total # of Customer Affected.

Table 7 shows 2009 CAIFI for each of the reporting Illinois utilities.

**Table 7 - 2009 CAIFI for Illinois Utilities**

Utility	CAIFI 2009
MidAmerican	3.01
Mt. Carmel	2.36
AmerenCIPS	2.13
AmerenCILCO	1.85
ComEd	1.84
<b>AmerenIP</b>	<b>1.6</b>

In 2009, AmerenIP's CAIFI average CAIFI (2.24) utilities and the lowest of six

was 1.6 about 29% below the reported by the other five reporting utilities.

Overall, AmerenIP's reliability compared to the Illinois utility AmerenIP's 2009 CAIDI is leaning toward the high side of the spectrum. AmerenIP should find ways to reduce its CAIDI For example, AmerenIP may install fault indicators, where appropriate, to reduce its outage response time, which in turn should

indices seem acceptable average. However,

<sup>3</sup> CAIDI indicates the average interruption duration for customers who had one or more interruptions during a specific year.

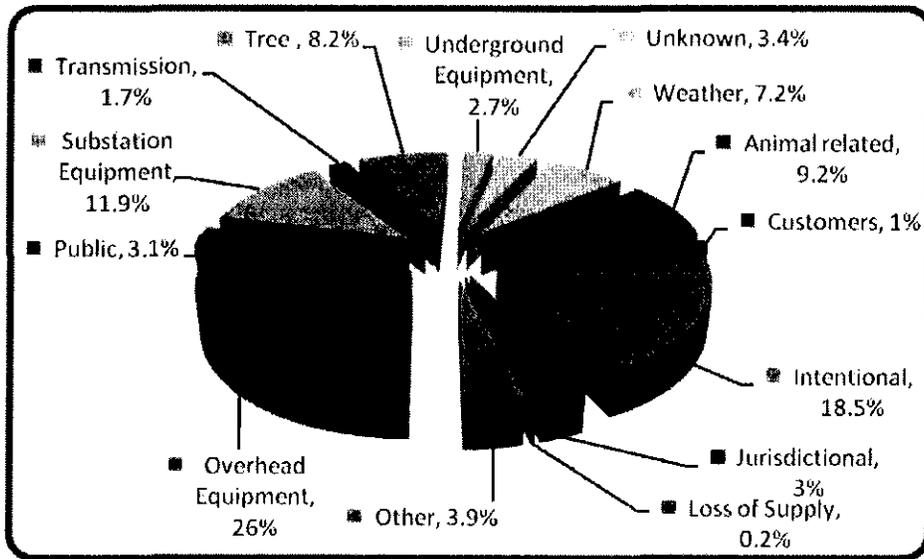
<sup>4</sup> CAIFI indicates the average interruption frequency for customers who had interruptions.

reduce the outage duration and CAIDI. AmerenIP should continue to strive to improve its performance and reduce its reliability indices.

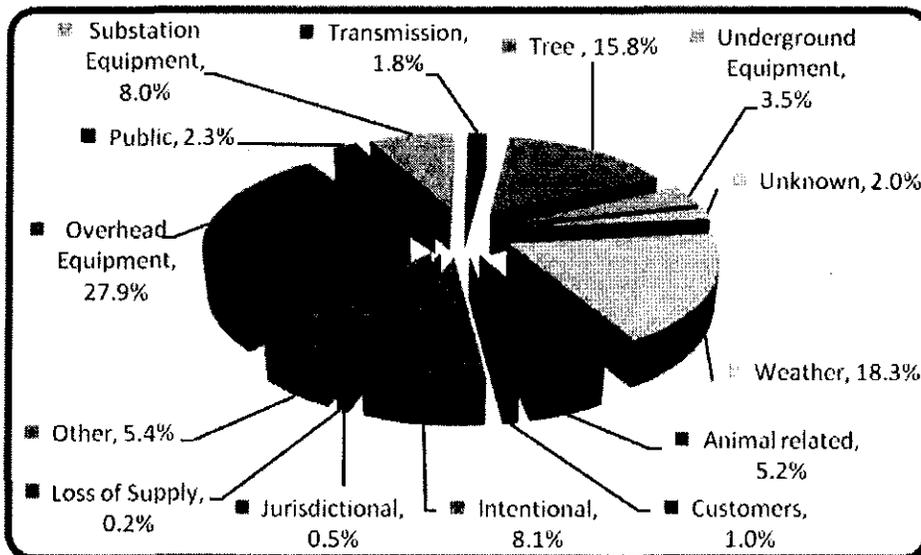
To comply with Section 411.130, AmerenIP classified and reported on the cause of each interruption using the cause categories and interruption code. AmerenIP reported that approximately 26% of customer interruptions (approximately 27.9% of customer minutes interrupted) in 2009 were related to overhead equipment, 8.2% (approximately 15.8% of customer minutes interrupted) to trees, 11.9% to substation equipment, 9.2% to animal, 18.5% to intentional, 7.2 % to weather, and 1.7 to transmission. The subtotal of the above categories is around 82.7% of total customer interruptions. Comparing 2008 to 2009 cause of interruptions, Staff found an increase in interruptions related to weather, transmission and jurisdictional. Staff encourages AmerenIP to find ways to reduce customer interruptions.

Figures 1 and 2 provide a summary of 2009 interruptions by cause category in terms of customer interruptions ("CI") and customer minutes interruptions ("CMI").

See Table 3 (attachment A) for more details.



**Figure 1: 2009 - Percentage of CI By Cause Category**



**Figure 2: 2009 - Percentage of CMI By Cause Category**

## B. Worst Performing Circuits

AmerenIP complied with Subsection 411.120(b)(3)(I)&(J) by providing tables that show the worst performing circuits (“WPC”) for 2009, what caused a circuit to be a worst performer, the history of each circuit, and any action taken or planned to improve the performance of each WPC. Table 8 shows AmerenIP’s WPCs for the 2009 calendar year. The bolded values in the SAIFI, CAIFI, and CAIDI columns indicate the indices that caused a circuit to be worst performer.

**Table 8**  
**AmerenIP CIRCUITS WITH HIGHEST SAIFI, CAIFI, & CAIDI**  
**WPC – CALENDAR YEAR 2009**

Circuit	Substation	SAIFI	CAIFI	CAIDI
J01118	Abingdon	1.01	1.39	<b>1661</b>
J68402	Bloomington Washington Street	<b>2.88</b>	2.88	115
K74166	Champaign Mattis Avenue	<b>3.28</b>	<b>3.28*</b>	211
L00134	Decatur Greenswitch Road	.25	1.24	<b>1615</b>
L59922	Du Quoin	.03	1.00	<b>995</b>
L59923	Du Quoin	<b>3.41</b>	<b>3.41*</b>	385
L59929	Du Quoin	<b>2.88</b>	<b>2.88</b>	272
L63936	Du Quoin Fairside	<b>3.39</b>	<b>3.39*</b>	245
M09143	Eldorado	2.10	2.10	<b>1231</b>
M09144	Eldorado	<b>2.88</b>	<b>2.88*</b>	731
M09175	Eldorado	1.44	1.44	<b>1487</b>
M41112	Galesburg North Seminary	.67	1.07	<b>1250</b>
P47125	Monmouth	.09	1.45	<b>1490</b>
Q06144	North Champaign	1.17	<b>3.00</b>	153
Q14392	North Ottawa	<b>3.44</b>	<b>3.44*</b>	332
Q18242	O’Fallon	.36	<b>3.28</b>	118
Q28141	Old Shawneetown	<b>3.16</b>	<b>3.16*</b>	833
Q32171	Oquawka Rural	.81	2.17	<b>984</b>
Q75145	Ridgeway	1.18	1.19	<b>1198</b>
Q75146	Ridgeway	<b>3.08</b>	<b>3.08*</b>	522
R04413	South Edwardsville	<b>3.44</b>	<b>3.44*</b>	106
R05115	South Farnham	.48	1.98	<b>990</b>
R71286	Valmeyer Rt. 156	.23	<b>3.39</b>	111

Notes:

Du Quoin Circuit L59922 was also a worst CAIDI performer in 2008<sup>5</sup>.

Monmouth Circuit P47125 was also a worst CAIDI performer in 2007.

Oquawka Circuit Q32171 was also a worst CAIDI performer in 2007.

South Edwardsville R04413 was also a worst SAIFI and CAIFI performer in 2006.

"\*\*" AmerenIP reported that it changed CAIFI to equal SAIFI value because indices are based upon end-of-year customer counts which can vary significantly due to circuit reconfiguration.

See Tables 37-38 (pages 60-61) in AmerenIP's 2009 revised annual reliability report for more details

### **C. Circuit Inspections**

AmerenIP indicates on page 16 of its 2009 revised reliability report that visual circuit inspection of distribution circuits is performed on a five-year cycle for the initial implementation phase which concludes on December 31, 2011, but will return to a four-year repeating cycle <sup>6</sup>. In addition, AmerenIP indicates on page 17 of its 2009 revised reliability report that emergency violations are corrected immediately. If the findings are not an emergency, AmerenIP corrects them within 90 days of notification, if involving an NESC issue (except overhead guys or down guys in good condition, which have 24 months to repair for this year's inspection results) and all other reported issues should be corrected within twelve months following the completion of the inspection. AmerenIP provided visual inspection reports to some of its 2009 WPCs in response to a Staff data request. AmerenIP listed many findings that were noted during those circuit inspections. For example, AmerenIP noted decayed/deteriorated crossarms, down guys without ground or insulation, bad insulator placement on down guys and overhead guys. AmerenIP's findings also included missing guy guards, wooden pins going through cross arms, decayed/deteriorated pole tops, inadequate clearance for primary wires, vines up to primary or natural wires, equipment without animal guards,

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<sup>5</sup> AmerenIP's 2009 revised reliability report (page 61) indicates that the CAIDI index of circuit L59922 in 2008 was 33 minutes; however, AmerenIP's response to Staff data request ENG 1.3 indicates that the CAIDI index of circuit L59922 in 2008 was 1220 minutes. The later number is correct as confirmed by AmerenIP.

<sup>6</sup> Staff found many National Electrical Safety Code (NESC) violations during 2007 circuit inspection. Staff and Ameren developed an October 31, 2007 NESC corrective action plan to timely identify and correct all NESC violations. On July 10, 2009, Ameren amended its October 31, 2007 NESC corrective action plan when it extended the cycle length of the visual circuit inspection program by one year, from four years to five years, for the initial implementation phase due to unexpected large number of violations.

blown/broken/missing arresters, bent and loose steel pins, low riser standoff brackets, primary riser not grounded, low pole steps, and coiled jumpers to arresters.

Staff inspected five circuits that AmerenIP reported among its WPCs in its 2009 revised annual reliability report: Circuit R71286 (Valmeyer Rt. 156 Substation), Circuit M41112 (Galesburg North Seminary Substation), Circuit R05115 (Galesburg South Farnham Substation), Circuit K74166 (Champaign Mattis Ave Substation), and Circuit L00-134 (Decatur Greenswitch Rd. Substation). This Section will provide some details about the inspected circuits and Staff's findings. The findings are not represented as capturing all of the potential reliability problems that may exist on the circuits that Staff inspected. In many cases, there were portions of the circuits that Staff did not inspect. Staff's findings do not necessarily belong to the circuits that Staff intended to inspect; some of the findings might belong to another circuit served by the inspected substations. Circuit identification is provided underneath each photo below, and if the circuit identification is not known, the address is provided without circuit identification. Staff reported the findings to AmerenIP and asked AmerenIP to provide plans and work schedules to correct each identified item. AmerenIP's response indicates that AmerenIP corrected some of Staff's findings and established work schedules to correct others.

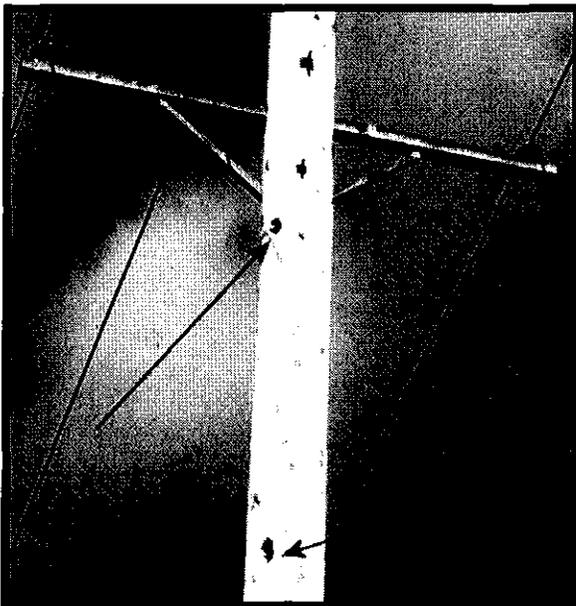
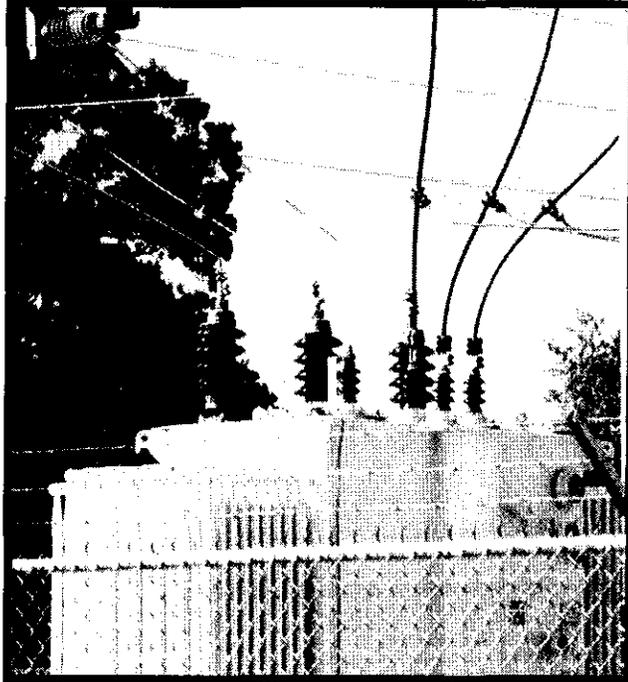
**Circuit R71286 – Valmeyer Rt. 156 Substation – Belleville – 2009 WPC (12 kV):**  
**(SAIFI = .23; CAIDI = 111; CAIFI = 3.39)**

This Circuit was one of the 2009 WPCs from a CAIFI perspective. During 2009, Circuit R71286's CAIFI was much higher than AmerenIP's 2009 CAIFI of 1.6. Circuit R71286 is a 12 kV rural circuit that serves 731 customers. During 2009, Circuit R71286 had 166 interruptions. AmerenIP reported that 49 interruptions were due to weather, 48 to trees, 26 to animal, 18 to overhead equipment, 18 to other causes, 5 to unknown causes, and 2 to underground malfunction. In a response to a Staff data request, AmerenIP responded that it completed all work identified during the 2008 visual inspection of circuit R71286 before August 8, 2009. AmerenIP reported that it completed a circuit-wide maintenance trimming in February 2006 at a cost of \$ 68,583. AmerenIP also reported that it completed a mid-cycle maintenance trimming (mid-cycle patrol) in 2008. On May 11, 2010, Staff inspected Circuit R71286. AmerenIP provided circuit maps to aid Staff during circuit inspection. Those maps were not complete or accurate. For example, circuit R71286 maps do not include some road and street names like Boehne Dr. In another case, AmerenIP listed Trout Camp Rd. as Camp Rd; this made it difficult for Staff to find the road using the GPS and wasted Staff's time. AmerenIP must provide accurate maps to aid Staff during circuit inspections. Staff noted some reliability problems (see photos 1-6) such as a substation transformer without animal guards, woodpecker holes in poles, trees close to the primary, a deteriorated pole top, and a loose pole-top pin. In addition, Staff noted deteriorated poles that AmerenIP marked

with red ribbons as a sign of rejection during a circuit inspection. Staff also noted some transformers without animal guards. AmerenIP corrected some of Staff's findings and provided a schedule to correct others.

**Photo No. 1: Substation Transformer without Animal Guards**

**Circuit R71286 Located at Valmeyer  
Rt 156 Substation, North of IL RT  
156**

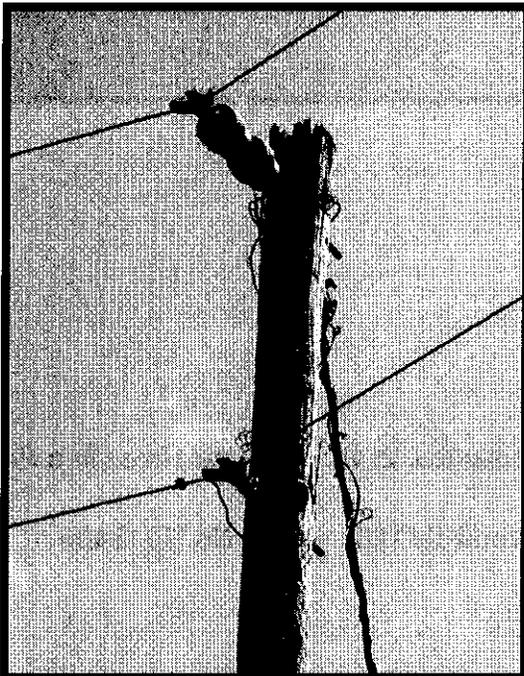


**Photo No. 2: Woodpecker Holes in a Pole**

**Circuit R71286 – Pole No. 2315406**

**Photo No. 3: Trees Close to the Primary**

**Circuit R71286 – Pole No. 2874634 on IL RT 156**

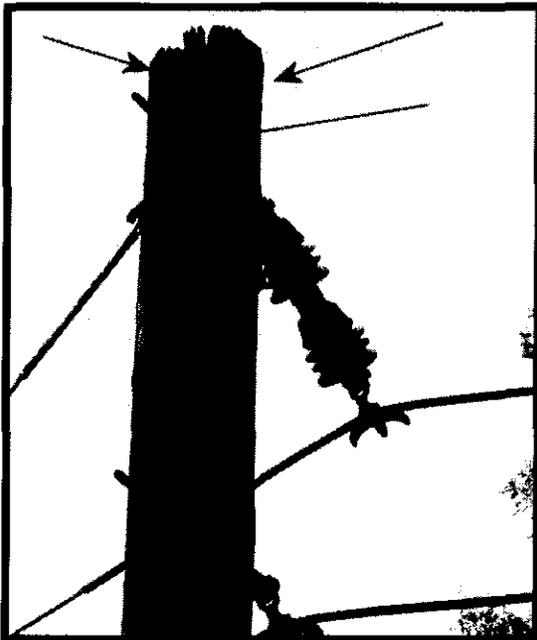
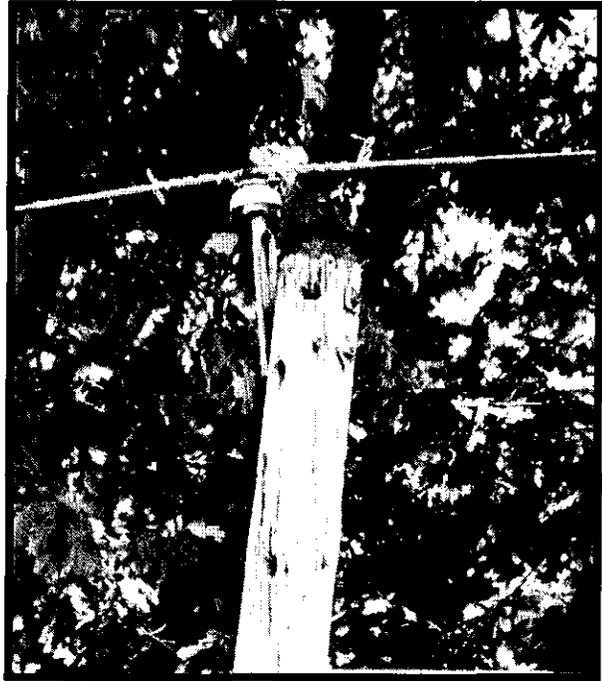


**Photo No. 4: Deteriorated Pole Top**

**Circuit R71286 – Located at Deer Hill Rd - Pole No. 2875074**

**Photo No. 5: Woodpecker Holes in a Pole and Loose Pole-Top Pin**

**Circuit R71286 – Located in front of the intersection of Deer Hill Rd and Trout Camp Rd-Pole No. 2906220**



**Photo No. 6: Woodpecker Holes in a Pole**

**Circuit R71286 – Pole No. 2891985**

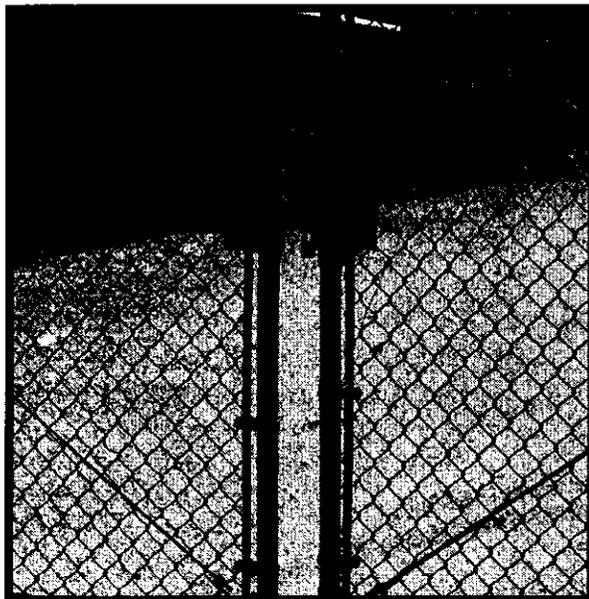
**Circuit M41112 – Galesburg N Seminary Substation – 2009 WPC – (12 kV): (SAIFI = .67; CAIDI = 1250; CAIFI = 1.07)**

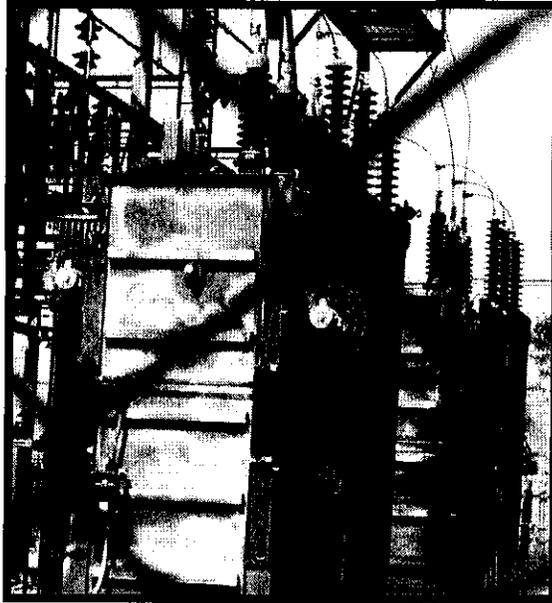
This circuit was one of the 2009 WPCs from a CAIDI perspective. During 2009, Circuit M41-112's CAIDI was much higher than AmerenIP's 2009 CAIDI of 187. Circuit M41-112 is a 12 kV urban circuit that serves 1281 customers. During 2009, Circuit M41-112 had 855 interruptions (1,062,786 minutes of interruption duration). AmerenIP reported that 464 interruptions (1,011,984 minutes) were due to trees, 343 (43,447 minutes) to overhead equipment, 23 (5,727 minutes) to underground malfunction, 15 (945 minutes) to Animal, 3 (326 minutes) to public, and 7 (357 minutes) to other causes. AmerenIP did not inspect Circuit M41-112 as part of the AmerenIP visual circuit inspection program yet. AmerenIP reported that it completed a circuit-wide maintenance trim in March 2009 at a cost of \$ 91,096. AmerenIP plans to perform a mid-cycle patrol in 2011.

On May 25, 2010, Staff inspected circuit M41-112. Staff noted some reliability problems (see photos 7 to 19) such as a large gap in the substation gate, debris on the barbed wires of the substation, rusted substation transformers, a tree growing inside the substation through the fence, bad insulator placement on down guys, down guys without grounding or insulators, missing cotter pin in the lower connection of a guy insulator, ungrounded metal riser, less than 8 feet between lowest two stand-off brackets of metal risers, deteriorated pole top, service drop over roofs with inadequate clearance, secondary lines running through or in contact with trees, leaning pole, and leaning pole top pins. AmerenIP corrected some of Staff's findings and provided a schedule to correct others.

**Photo No. 7:** Large gap in the substation gate

**Circuit M41-112:** Located at 2347 N Seminary St





**Photo No. 8: Rusted substation transformers**

**Circuit M41-112: Located at 2347 N Seminary St**

**Photo No. 9: Debris on the  
barbed wire above the substation  
fence**

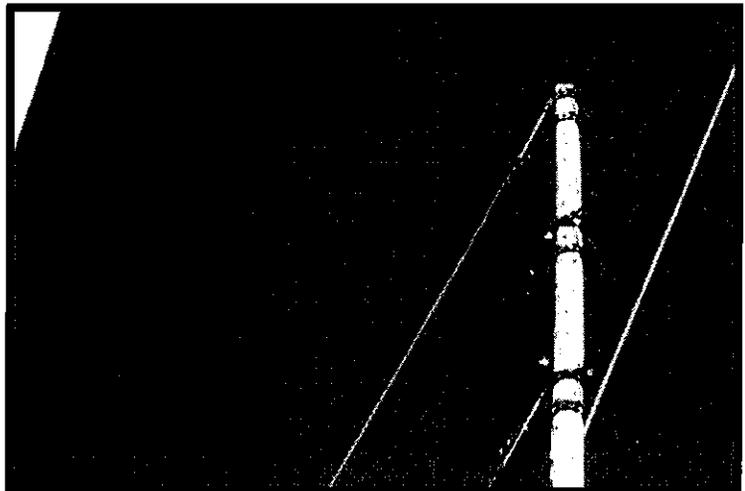
**Circuit M41-112: Located at  
2347 N Seminary St**





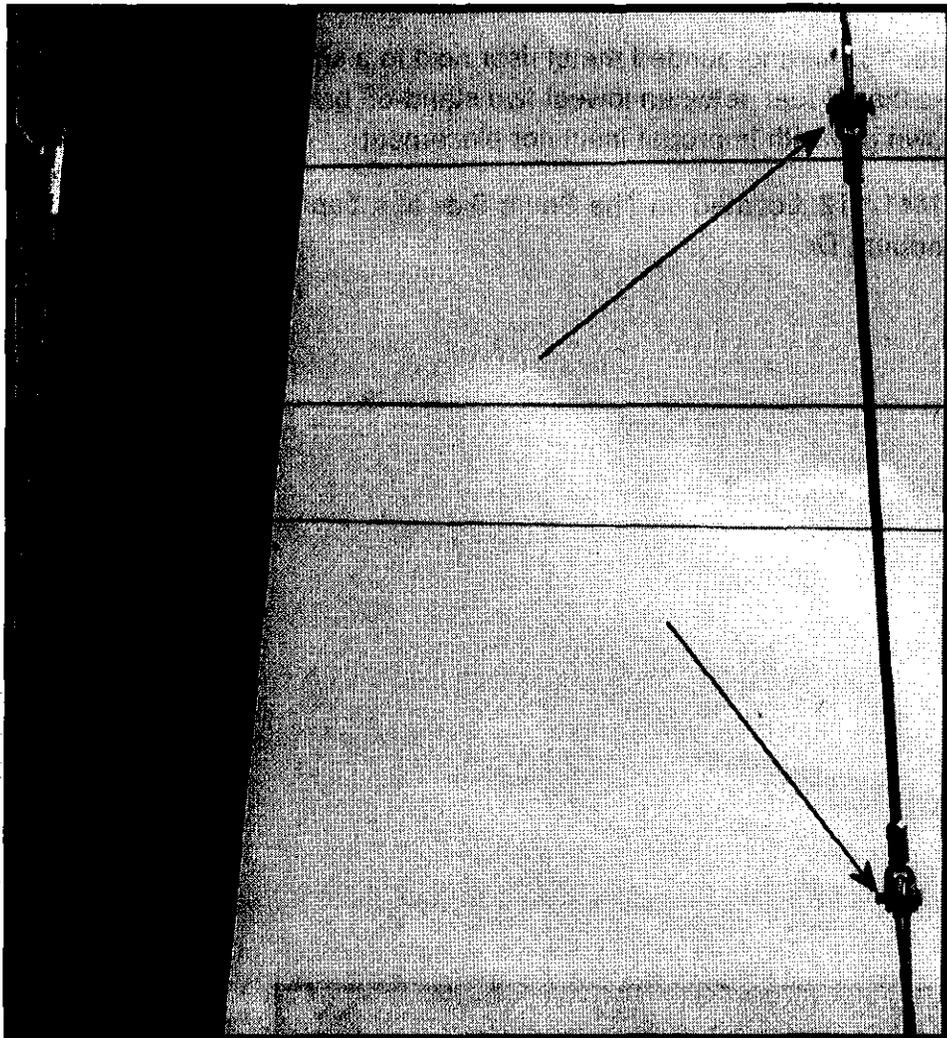
**Photo No. 10:** A tree growing from inside the substation through the substation fence

**Circuit M41-112:** Located at 2347 N Seminary St



**Photo No. 11:** Bad insulator placement on a down guy (the insulator should be below the level of the lowest energized conductor when the guy is loose)

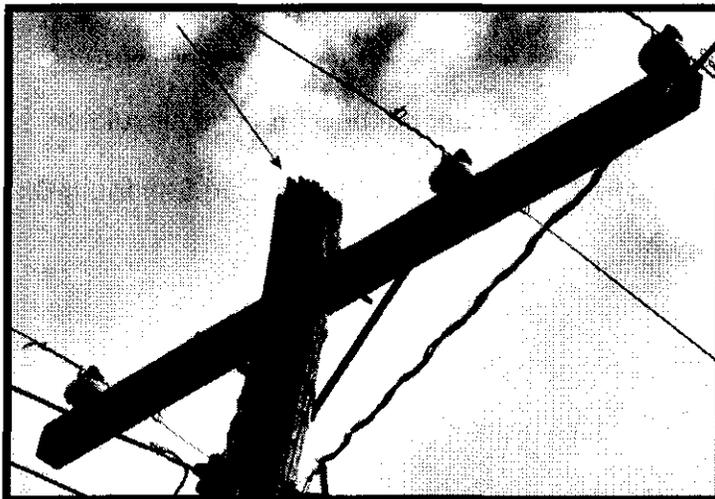
**Circuit M41-112:** Located at Carl Sandburg Dr. outside the Substation Fence



**Photo No. 12: Missing Cotter pin in the lower connection of guy insulator**  
**Circuit M41-112: Located on a The South Side in a Tap off Carl Sandburg Dr**

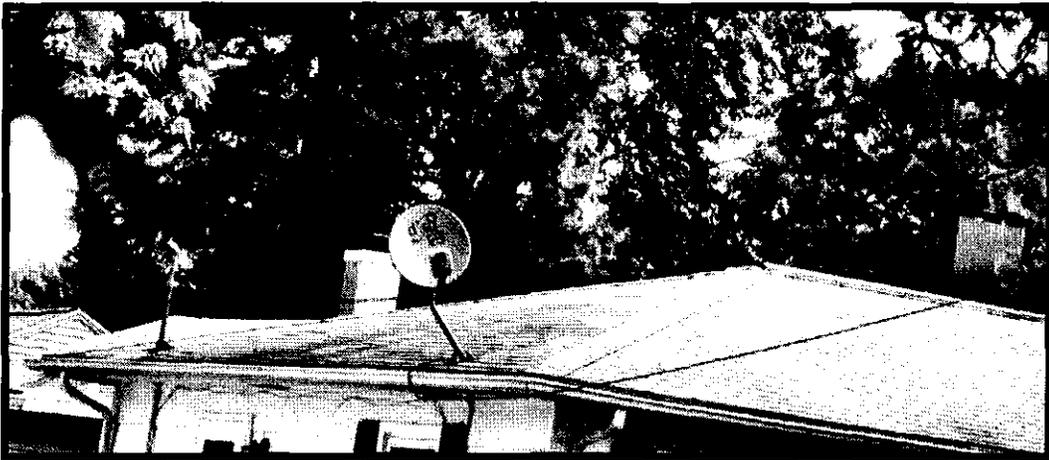
**Photo No. 13:** An ungrounded metal riser next to a school with Less than 8 feet between lowest two stand-off brackets and a down guy with improper insulator placement

**Circuit M41-112:** Located on The South Side in a Tap off Carl Sandburg Dr



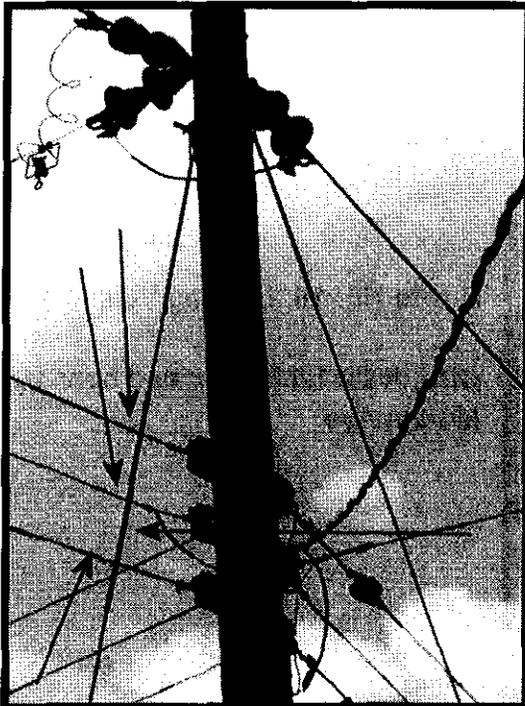
**Photo No. 14:** A Deteriorated Pole Top

**Circuit M41-112:** Located in Front of 907 Lane Ave



**Photo No. 15: Service drop over a roof with inadequate clearance**

**Circuit M41-112: Located on 907 Lane Ave**

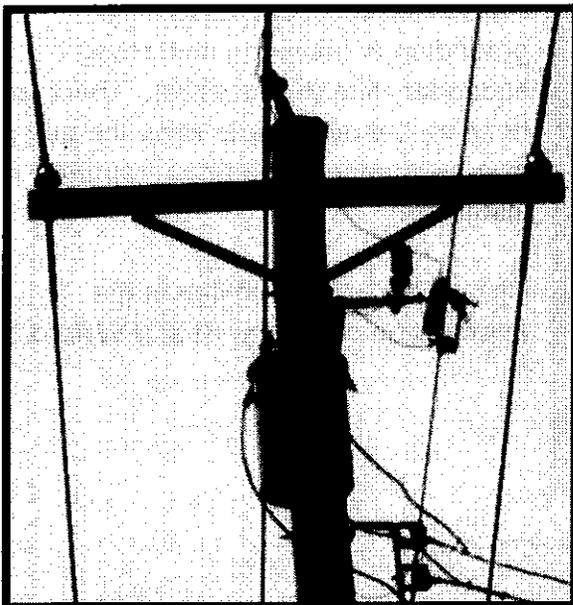
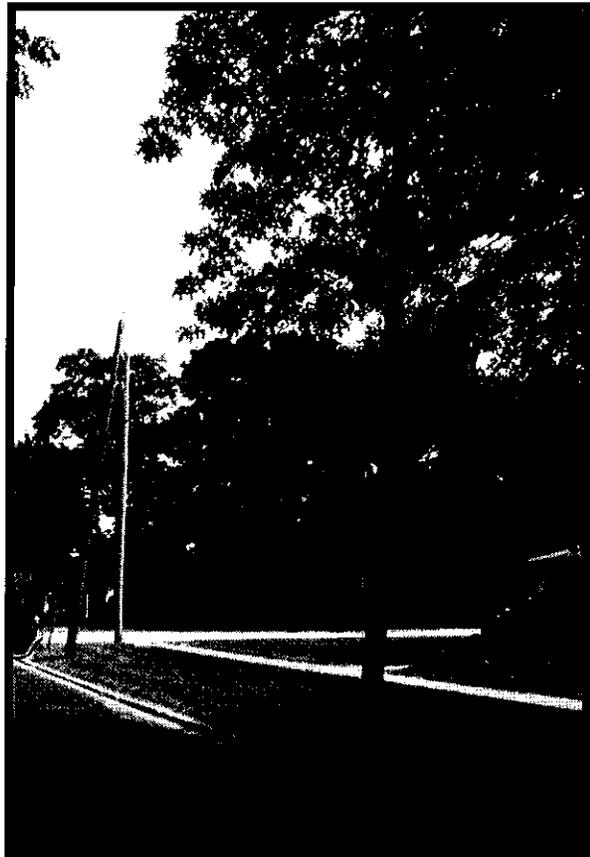


**Photo No. 16: A down guy W/O grounding or insulator, contacting the secondary line (three wires). There is a hose on the guy wire to keep the guy wire from being energized (inappropriate insulation)**

**Circuit M41-112: Located in the Intersection of Dayton St and Willard St**

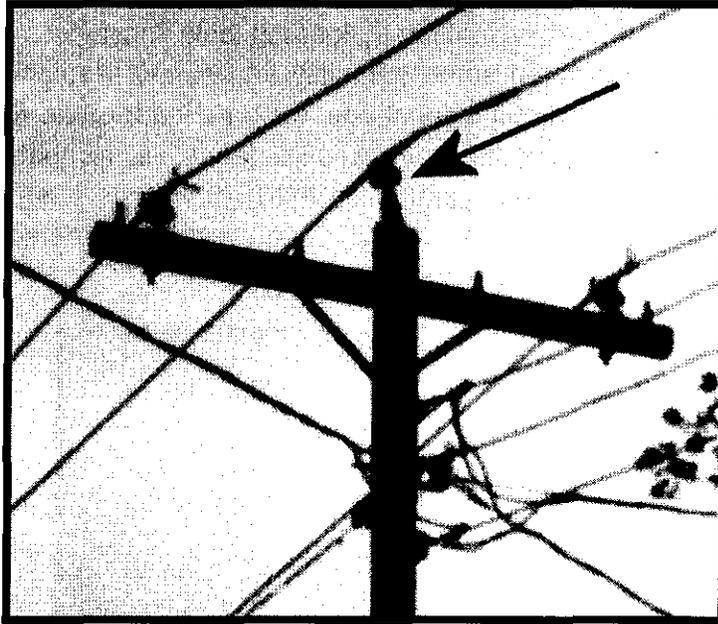
**Photo No. 17: Leaning Pole**

**Circuit M41-112:** Located in Front of 1187 Brown Ave. near the intersection of Brown Ave. and Fremont



**Photo No. 18: Leaning Pole-Top Pin**

**Circuit M41-112:** Located near 1608 Morton Ave



**Photo No. 19: Leaning Pole-Top Pin**

**Circuit M41-112: Located near 1116 Harrison St**

**Circuit R05115 – Galesburg, South Farnham Substation – 2009 WPC (12 kV):  
(SAIFI = .48; CAIDI = 990; CAIFI = 1.98)**

This circuit was one of the 2009 WPCs from a CAIDI perspective. During 2009, Circuit R05115's CAIDI was much higher than AmerenIP's 2009 CAIDI of 187. Circuit R05115 is a 12 kV rural circuit that serves 914 customers. During 2009, Circuit R05115 had 443 interruptions (439,059 minutes of interruption duration). AmerenIP reported that 198 interruptions (25,268 minutes) were due to overhead equipment, 142 (118,152 minutes) to trees, 89 (290,325 minutes) to other causes, 7 (567 minutes) to public, 3 (4,346 minutes) to weather, 2 (68 minutes) to animal, 1 (203 minutes) to underground malfunction, and 1 (130 minutes) to unknown. AmerenIP reported that it completed the visual inspection of Circuit R05115 on March 19, 2010. AmerenIP reported that it completed a circuit-wide maintenance trimming in February 2008 at a cost of \$ 46,263. AmerenIP plans to perform a mid-cycle patrol in 2010. On May 25, 2010, Staff inspected Circuit R05115. Staff noted reliability problems that are consistent with AmerenIP's circuit inspection report, such as coiled wires to arresters, ungrounded

risers, down guys not grounded or insulated, leaning pole top pins, and deteriorated crossarms. In addition, Staff noted some reliability and safety problems that were not detected by AmerenIP's visual circuit inspections, such as inadequate fence grounding, vegetation around the corner of the substation's fence, a climbable metal riser, substation transformer without animal guards on the high voltage bushing, and broken substation gates (examples, photos 20 and 21). AmerenIP corrected some of Staff findings and provided a schedule to correct others.



**Photo No. 20:** Missing ground wire from the substation fence in the left photo compared to the right photo

**Circuit R05-115:** Located at 1245 S Farnham St.

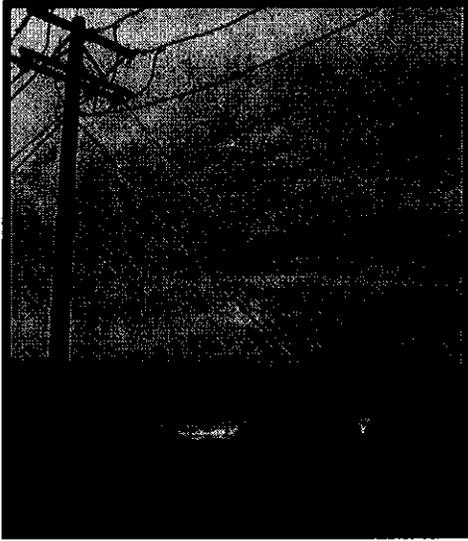
**Photo No. 21: Broken substation gate**

**Circuit R05-115: Located at 1245 S Farnham St., S Farnham St Substation**



**Circuit K74166 – Champaign Mattis Avenue Substation 2009 WPC – (12 kV):  
(SAIFI = 3.28; CAIFI = 3.28; CAIDI = 211)**

This circuit was one of the 2009 worst performer circuits from a SAIFI and CAIFI perspective. During 2009, Circuit K74166's SAIFI was much higher than AmerenIP's 2009 SAIFI index of .99, and the circuit's CAIFI was much higher AmerenIP's CAIFI of 1.60. Circuit K74166 had 4,022 interruptions. AmerenIP reported that 1,787 interruptions were due to overhead equipment, 876 to public, 539 to trees, 519 to weather, 142 to unknown, 84 to animal, and 75 to underground malfunction. AmerenIP reported that it inspected Circuit K74166 as part of AmerenIP's 2010 visual circuit inspection program and was working on correcting issues found during this inspection. AmerenIP reported that it completed a circuit-wide maintenance trimming in March of 2009 at a cost of \$120,571. AmerenIP plans to perform a mid-cycle patrol in 2011. On September 14, 2010, Staff inspected Circuit K74166. Staff noted reliability problems (see photos 22-31) such as, down guy with bad insulator placement, outer down guy with bad insulator placement, split pole top, split/damaged pole top, unwrapped guy wire tie, leaning pole with equipment, trees close to a high voltage spacer cable, broken spacer on a spacer cable, loose pole top pin, leaning pole with equipment, and trees close to the primary. AmerenIP corrected some of Staff's findings and provided a schedule to correct others.

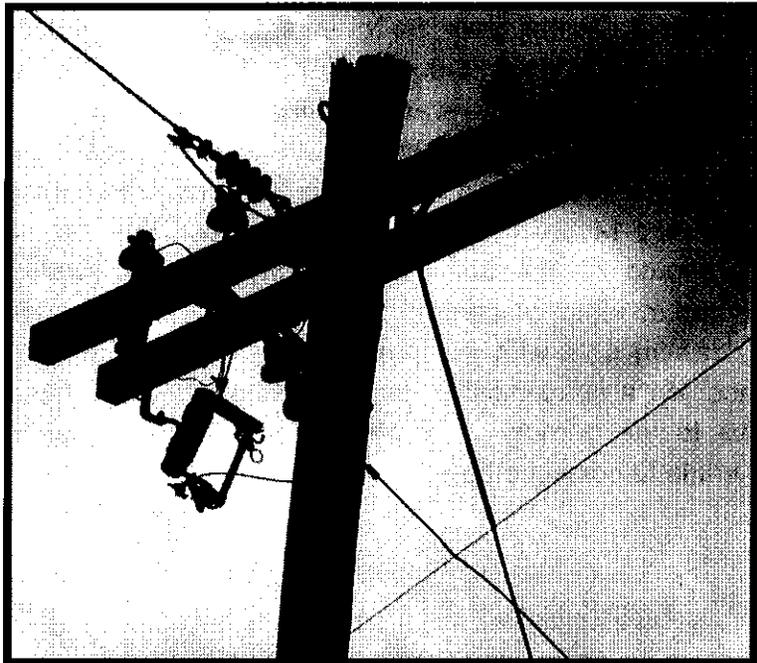


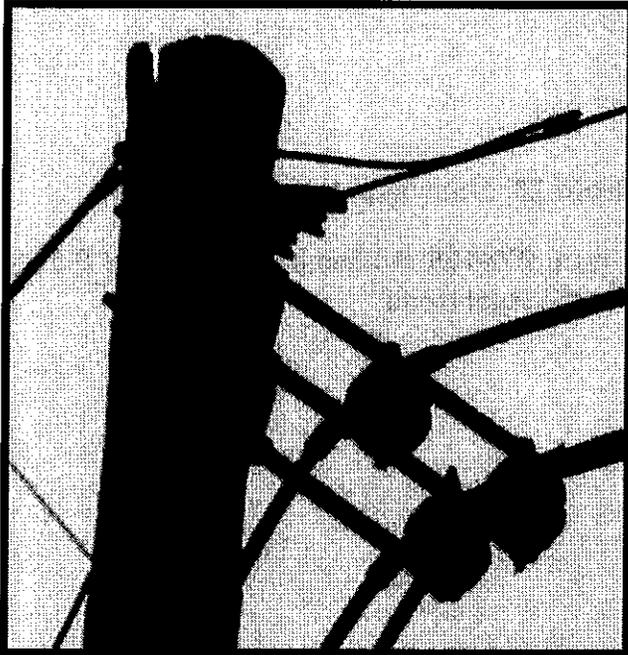
**Photo 22:** Down guys with bad insulator placement

**Circuit K74-166:** Pole No. 2208302 – near Mattis Substation

**Photo 23:** Split Pole Top

**Circuit K74-166:** Pole No. 2208301 – near Mattis Substation





**Photo 24: Split/damaged pole top**

**Circuit K74-166: Pole No.  
2208305 – near Mattis Substation**

**Photo 25: Unwrapped guy wire tie**

**Circuit K74-166: Pole No. 2208305 – near  
Mattis Substation**





**Photo 26:** Leaning pole with equipment

**Circuit K74166:** Across from the Mattis Substation  
and the Real Road