



## AmerenUE 4 CSR 240-23.020 Electrical Corporation Infrastructure Standards Annual Inspection Report for Calendar Year 2009

### Introduction

This document is Union Electric (dba AmerenUE) Company's annual report detailing its compliance with Missouri Public Service Commission Rule 4 CSR 240-23.020, Electrical Corporation Infrastructure Standards (referred to in the remainder of this document as "the Rule"). This annual report is required by Section (3) (C) of the Rule which states, *"Each electrical corporation subject to this rule shall file...an annual report detailing its compliance with this rule during the prior calendar year...."* This report details the results of the infrastructure inspections conducted in calendar year 2009.

### Definitions

For the purposes of this report, the following definitions shall apply:

1. Visual Inspection – A careful visual examination of equipment and structures designed to identify structural problems, hazards, and defective or improperly operating equipment. Equivalent to "Detailed Inspection" as defined in Section (2) (B) of the Rule.
2. Ground Line Inspection – A complete intrusive inspection of overhead poles whereby the pole is excavated to a depth of 18 to 24 inches, tested for internal and external decay, treated with a preservative, and then backfilled. Equivalent to "Intrusive Inspection" as defined in Section (2) (C) of the Rule.
3. Overhead Equipment – Equipment used in the operation of the transmission and distribution system mounted on overhead poles including, but not limited to, conductors, transformers, fuses, switches, insulators, and lightning arresters.
4. Underground Pad-Mounted Equipment – Underground Residential Distribution (URD) system equipment including single phase and three phase pad-mounted transformers, pad-mounted switchgear, junction boxes, non-traffic rated vaults, and pedestals. Equivalent to "Underground-direct buried and conduit" and the equipment noted under Note 3 on the table entitled, "Electrical Corporation System Inspection Cycles (Maximum Intervals in Years)" included with the Rule.
5. Transmission System – That portion of the AmerenUE system operated at voltages of 100 kilovolts (kV) and above.
6. Distribution System – That portion of the AmerenUE system operated at voltages below 100kV.
7. Streetlights – Automatically controlled lighting for lighting of streets, alleys, walkways, and other thoroughfares open to and reserved for general public use when such lighting facilities are operated and maintained as an extension of AmerenUE's distribution system as described in Service Classification 5(M). This definition does not apply to lighting installed on public or private premises for the purpose of providing area or security lighting (i.e., "dusk-to-dawn" lights), customer-owned street and outdoor lighting as described in Service Classification 6(M), and



incandescent municipal streetlighting or private streetlighting described under Service Classifications 7(M) and 8(M).

### Transmission System Inspections

AmerenUE conducted inspections on its Transmission System during calendar year 2009 as required by Missouri Public Service Commission Rule 4 CSR 240-23.020, Electrical Corporation Infrastructure Standards. The inspections conducted, as well as the deficiencies discovered and repaired as a result of these inspections, are described below.

### Transmission Circuits Inspected in 2009:

Inspection Type	Inspections Scheduled	Inspections Completed	Inspections Not Completed
“Patrol”	140	140	None
“Detailed”	7	7	None
Ground Line	8	8	None

The results of the lines inspected are summarized as follows:

### Results of Inspections

Component	Number Inspected	Number Requiring Repairs	%
Wood Poles	2891	69	2.4
Wood Structures	14645	95	0.65
Non-Wood Structures	5637	11	0.20
Conductors*	20282	0	0.0
Insulators*	20282	4	0.02

The numbers of components requiring repairs in the period are summarized below:

Component	Number Requiring Repairs in the Period	Number of Repairs Completed in the Period	%	Number of Repairs Not Completed in the Period	%
Wood Poles	23	23	100	0	0.0
Wood Structures	31	31	100	0	0.0
Non-Wood Structures	11	11	100	0	0.0
Conductors*	0	0	0.0	0	0.0
Insulators*	0	0	0.0	0	0.0



\*Note: Because AmerenUE's Transmission System Inspection Program is carried out on a per line basis and only those components which required repair are recorded, the number of individual conductors and insulators inspected is not recorded. The number of poles and non-wood structures inspected will be used as the reference for the percentage of equipment requiring corrective action in this annual report.

The following equipment was scheduled for repairs outside the reporting period:

Component	Total Number Requiring Repairs Outside the Reporting Period	Number of Open Repairs Outside the Reporting Period	Corrective Action Scheduled Complete						%
			3Q10	4Q10	1Q11	2Q11	3Q11	4Q11	
Wood Poles	46	46	5	10	5	10	5	11	100
Wood Structures	64	64	1	24	19	10	5	5	100
Non-Wood Structures	0	0	0	0	0	0	0	0	0.0
Conductors	0	0	0	0	0	0	0	0	0.0
Insulators	4	4	0	4	0	0	0	0	100



## Distribution System Inspections

AmerenUE conducted inspections on its Distribution System during calendar year 2009 as required by Missouri Public Service Commission Rule 4 CSR 240-23.020, Electrical Corporation Infrastructure Standards. The inspections conducted, as well as the deficiencies discovered and repaired as a result of these inspections, are described below.

### Distribution Circuits and Components Inspected in 2009

Inspection	Inspection Units	Inspections Scheduled	Inspections Completed	Inspections Not Completed
Overhead Visual*	Circuit	581	581	0
Overhead Ground Line*	Circuit	262	262	0
Capacitors	Equipment	4523	4523	0
Reclosers	Equipment	2242	2242	0
Sectionalizers	Equipment	70	70	0
Voltage Regulators	Equipment	525	525	0
Underground Patrol* #	Circuit	255	255	0
Underground Detailed* #	Circuit	264	264	0
Network Vaults	Equipment	126	126	0
Manholes ##	Equipment	1912	1667	245
Other Underground Structures**	Equipment	91	91	0

\*Note: Streetlight inspections were performed in conjunction with Overhead Visual and Ground Line inspections, as well as the Underground Patrol and Detailed inspections.

\*\*Note: Other Underground Structures include Indoor Rooms and Manhole Transformers.



#Note: During the Underground Patrol and Detailed circuit inspections, AmerenUE inspectors encountered various obstructions that prevented inspection of some individual pieces of equipment such as pad-mounted transformers. The obstructions encountered were customer facilities such as fences or landscaping in close proximity to equipment, thereby preventing its full inspection. Many of these situations require negotiations with customers to determine the best remedy for the customer and AmerenUE. AmerenUE has resolved most of the issues and continues to work with customers to resolve the remaining obstructions in order to complete the inspections of the equipment.

##Note: 245 manholes were not inspected in 2009 as a result of problems such as paved over manholes, manholes located in construction areas, manholes located in fenced areas on private property, manholes located on Lambert International Airport property which required airport authority coordination to complete the inspection, and manholes located in railroad areas which required railroad authority coordination to complete the inspection. 70 of these inspections have already been completed in 2010. The remaining 175 will be completed by 12/31/10.

The following inspections were scheduled to be completed in 2009 but were not:

Inspections Scheduled But Not Completed in 2009

Operating Center	Inspection Type	Circuit Number	Component Number	Reason Inspection Not Completed	Date Inspection Will Be Completed
Geraldine	Manhole	N/A	70 manholes	Paved over in streets, in construction areas, on private property in fenced areas, on airport property, and on railroad property.	Completed in 2010
Geraldine	Manhole	N/A	175 manholes	Paved over in streets, in construction areas, on private property in fenced areas, on airport property, and on railroad property.	12/31/10



The results of the inspections are summarized as follows:

### Results of Inspections

Component	Number Inspected	Number Requiring Repairs	Percentage
Poles	235412	3871	1.6
Lightning Arresters*	235412	636	0.3
Crossarms*	235412	429	0.2
Crossarm Braces*	235412	425	0.2
Fuses*	235412	12	0.01
Insulators*	235412	373	0.2
Transformers*	235412	114	0.05
Conductors*	235412	268	0.1
Switches*	235412	2	0.0
Guy Wires*	235412	See Note*****	0.0
Grounding*	235412	11276	4.8
Minor Hardware*#	235412	2153	0.9
Capacitors	4523	283	6.3
Reclosers	2242	44	2.0
Sectionalizers	70	6	8.6
Voltage Regulators	525	39	7.4
UG Pad-Mounted Equipment**	31128	10665	34.3
Vaults	126	29	23.0
Manholes	1667	107	6.4
Other Underground Structures***	91	1	1.1
Streetlights	61881	6098	9.9

\*Note: Because AmerenUE's Distribution System Circuit Inspection and Ground Line Inspection programs were performed on a per circuit basis and only those components which required repair were recorded, the numbers of these individual devices inspected were not recorded. For these components, the number of poles where problems were identified divided by the number of poles inspected was used as the reference for the percentage of equipment requiring corrective action. Where the actual number of components inspected, such as reclosers, sectionalizers, voltage regulators, and capacitors could be ascertained, these numbers were used to calculate the percentage of equipment requiring corrective action.

#Note: Minor Hardware includes risers, pins, flying loops, and spacer cable brackets.



**\*\*Note:** Underground Pad-Mounted Equipment includes pad-mounted transformers, switchgear, junction boxes, non-traffic rated vaults, and pedestals.

**\*\*\*Note:** Other Underground Structures includes indoor rooms and manhole transformers.

**\*\*\*\*Note:** The instructions given to the inspection contractor for guy wire inspections were based on an incorrect interpretation of the requirements. As a result, a large number of guy wire insulation issues were called out based on incorrect criteria during the 2009 inspections. AmerenUE will re-inspect all of the identified guying issues over a period of the next four years. It is anticipated that only a small percentage of those issues will actually require repairs. None of these issues represent an imminent threat to reliability or safety.

The numbers of components requiring repairs in the period are summarized below:

Component	Number Requiring Repairs in the Period	Number of Repairs Completed in the Period	%	Number of Repairs Not Completed in the Period	%
Poles	720	720	100	0	0.0
Lightning Arresters	69	69	100	0	0.0
Crossarms	100	100	100	0	0.0
Crossarm Braces	68	68	100	0	0.0
Fuses	3	3	100	0	0.0
Insulators	34	34	100	0	0.0
Overhead Transformers	0	0	0.0	0	0.0
Conductors	69	69	100	0	0.0
Switches	1	1	100	0	0.0
Guy Wires	3909	3909	100	0	0.0
Grounding	3830	3830	100	0	0.0
Minor Hardware	269	269	100	0	0.0
Reclosers	41	41	100	0	0.0
Sectionalizers	5	5	100	0	0.0
Capacitors	258	258	100	0	0.0
Voltage Regulators	33	33	100	0	0.0
UG Pad-Mounted Equipment	2453	2453	100	0	0.0
Vaults	0	0	0.0	0	0.0
Manholes	83	83	100	0	0.0
Other Underground Structures	0	0	0.0	0	0.0
Streetlights	962	962	100	0	0.0

All equipment repairs required in the reporting period were completed in the period.



The following equipment was scheduled for repairs outside the reporting period:

Component	Total Number Requiring Repairs Outside the Reporting Period	Number of Open Repairs Outside the Reporting Period	Corrective Action Scheduled Complete						%
			1Q10	2Q10	3Q10	4Q10	2011	2012	
Poles	3151	782	2	10	148	618	4	0	24.8
Lightning Arresters	567	275	0	5	138	132	0	0	48.5
Crossarms	329	161	0	7	64	90	0	0	48.9
Crossarm Braces	357	135	0	8	46	81	0	0	37.8
Fuses	9	3	0	0	1	2	0	0	33.3
Insulators	339	185	0	3	61	121	0	0	54.6
Transformers	114	43	0	1	8	34	0	0	37.7
Conductors	199	63	0	4	18	41	0	0	31.7
Switches	1	0	0	0	0	0	0	0	0.0
Guy Wires	See Note****	-	-	-	-	-	-	-	-
Grounding	7446	2125	0	127	730	1268	0	0	28.5
Minor Hardware	1884	969	0	12	251	706	0	0	51.4
Reclosers	3	0	0	0	0	0	0	0	0.0
Sectionalizers	1	0	0	0	0	0	0	0	0.0
Capacitors	25	9	0	9	0	0	0	0	36.0
Voltage Regulators	6	0	0	0	0	0	0	0	0.0
UG Pad-Mounted Equipment	8212	1724	6	13	43	1164	498	0	21.0
Vaults*	29	28	0	0	0	0	0	28	96.6
Manholes	24	23	0	0	0	0	0	23	95.8
Other Underground Structures	1	1	0	0	0	0	1	0	100
Streetlights	5136	86	2	0	7	77	0	0	1.7