



## Ameren Missouri 20 CSR 4240-23.020 Electrical Corporation Infrastructure Standards Annual Inspection Report for Calendar Year 2019

### Introduction

This document is Union Electric (dba Ameren Missouri) Company's annual report detailing its compliance with Missouri Public Service Commission Rule 20 CSR 4240-23.020, 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 2019.

### Definitions

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

1. Patrol – A simple visual inspection, of applicable electrical corporation equipment and structures, which is designed to identify obvious structural problems and hazards. Patrols may be carried out in the course of other electrical corporation business.
2. 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.
3. 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.
4. 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.
5. 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.
6. Transmission System – That portion of the Ameren Missouri system operated at voltages of 100 kilovolts (kV) and above.
7. Distribution System – That portion of the Ameren Missouri system operated at voltages below 100kV.
8. 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 Ameren Missouri'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

Ameren Missouri conducted inspections on its Transmission System during calendar year 2019 as required by Missouri Public Service Commission Rule 20 CSR 4240-23.020, Electrical Corporation Infrastructure Standards. The inspections conducted, as well as the deficiencies discovered and repaired as a result of these inspections, are described below.

Table 1  
Transmission Circuits Inspected in 2019:

Inspection Type	Inspections Scheduled	Inspections Completed	Inspections Not Completed
“Patrol”	140	140	0
“Detailed”	0	0	0
Ground Line	10	10	0

The results of the lines inspected are summarized as follows:

Table 2  
Results of Inspections

Component	Number Inspected	Number Requiring Repairs	%
Wood Poles	4145	27	0.7%
Wood Structures	14,645	733	5.0%
Non-Wood Structures	5,637	7	0.1%
Conductors*	20,282	3	0.015%
Insulators*	20,282	153	0.75%

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

Table 3

Component	Number Requiring Repairs in the Period	Number of Repairs Completed in the Period	%	Number of Repairs Not Completed in the Period	%
Wood Poles	0	0	100%	0	0.0%
Wood Structures	5	33	100%	0	0.0%
Non-Wood Structures	1	51	100%	0	0.0%
Conductors*	1	1	100%	0	0.0%
Insulators*	0	0	100%	0	0.0%



\*Note: Because Ameren Missouri'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 wood structures (which includes 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:

Table 4

Component	Total Number Requiring Repairs Outside the Reporting Period	Number of Open Repairs Outside the Reporting Period	Corrective Action Scheduled Complete			Percent of Equipment in Need of Corrective Action, but with a Scheduled Date Beyond the Reporting Period
			2020	2021	Later	
Wood Poles*	27	27	0	8	19	100%
Wood Structures*	728	700	85	150	465	95.5%
Non-Wood Structures*	6	6	0	6	0	100%
Conductors*	2	2	1	1	0	100%
Insulators*	153	153	25	30	98	100%



## Distribution System Inspections

Ameren Missouri conducted inspections on its Distribution System during calendar year 2019 as required by Missouri Public Service Commission Rule 20 CSR 4240-23.020, 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 2019

Table 5

Inspection	Inspection Units	Inspections Scheduled	Inspections Completed	Inspections Not Completed
Overhead Visual *	Circuit	385	385	0
Overhead Ground Line *	Circuit	259	259	0
Capacitors	Equipment	1,252	1,252	0
Voltage Regulators	Equipment	577	577	0
Underground Patrol #	Circuit	248	248	0
Underground Detailed #	Circuit	263	263	0
Network Vaults	Equipment	112	112	0
Manholes	Equipment	1,578	1,576	2
Other Underground Structures **	Equipment	97	97	0

The two manholes were not inspected as they are located inside a condemned building that is not structurally safe. Ameren has plans to abandon these 2 manholes.

\*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.



The results of the inspections are summarized as follows:

Table 6  
Results of Inspections

Component	Number Inspected	Number Requiring Repairs	Percentage
Poles/Towers*	163,260	3,147	1.9%
Anchors*	163,260	14	0.0%
Conductors*	163,260	265	0.2%
Crossarm Braces*	163,260	462	0.3%
Crossarms*	163,260	2,418	1.5%
Fuses*	163,260	18	0.0%
Grounding*	163,260	1,485	0.9%
Guy Wires*	163,260	2,489	1.5%
Insulators*	163,260	1,380	0.8%
Lightning Arresters*	163,260	613	0.4%
Minor Hardware**	163,260	3,264	2.0%
Overhead Transformers*	163,260	408	0.2%
Reclosers*	163,260	-	0.0%
Sectionalizers*	163,260	-	0.0%
Switches	163,260	5	0.0%
Capacitors*	1,252	260	20.8%
Voltage Regulators	577	53	9.2%
UG Pad-Mounted Equipment**	39,974	3,215	8.0%
Network Vaults	112	27	24.1%
Manholes*	1,576	196	12.4%
Other Underground Structures***	97	8	8.2%
Streetlights	53,550	1,352	2.50%

\*Note: Because Ameren Missouri'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 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, jumpers, connectors, splices, terminations, 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.



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

Table 7

Component	Number of Repairs Scheduled in the Period	Number of Repairs Completed in the Period	% Repairs Completed in Period	Number of Repairs Not Completed in the Period	% Repairs Not Completed in Period
Poles/Towers*	182	182	100.0%	0	0.0%
Anchors*	0	0	0.0%	0	0.0%
Conductors*	5	5	100.0%	0	0.0%
Crossarm Braces*	1	1	100.0%	0	0.0%
Crossarms*	10	10	100.0%	0	0.0%
Fuses*	0	0	0.0%	0	0.0%
Grounding*	0	0	0.0%	0	0.0%
Guy Wires*	0	0	0.0%	0	0.0%
Insulators*	5	5	100.0%	0	0.0%
Lightning Arresters*	0	0	0.0%	0	0.0%
Minor Hardware*#	2	2	100.0%	0	0.0%
Overhead Transformers*	0	0	0.0%	0	0.0%
Reclosers*	0	0	0.0%	0	0.0%
Sectionalizers*	0	0	0.0%	0	0.0%
Switches	0	0	0.0%	0	0.0%
Capacitors*	163	163	100.0%	0	0.0%
Voltage Regulators	27	27	100.0%	0	0.0%
UG Pad-Mounted Equipment**	1,705	1,705	100.0%	0	0.0%
Network Vaults	0	0	0.0%	0	0.0%
Manholes*	0	0	0.0%	0	0.0%
Other Underground Structures***	0	0	0.0%	0	0.0%
Streetlights	446	446	100%	0	0.0%



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

Table 8

Component	Total Number Requiring Repairs Outside the Reporting Period (Completed or Scheduled)	Number of Open Repairs Outside the Reporting Period	Corrective Action Scheduled in 2020	Corrective Action Scheduled Later	Percent of Equipment in Need of Corrective Action but with a Scheduled Date Beyond the Reporting Period
Poles/Towers*	2,965	2,442	2,375	67	94.2%
Anchors*	14	13	12	1	100.0%
Conductors*	260	250	190	60	98.1%
Crossarm Braces*	461	446	354	92	99.8%
Crossarms*	2,408	2,353	2,005	348	99.6%
Fuses*	18	18	17	1	100.0%
Grounding*	1,485	1,390	1,096	294	100.0%
Guy Wires*	2,489	2,348	1,601	747	100.0%
Insulators*	1,375	1,349	1,198	151	99.6%
Lightning Arresters*	613	591	521	70	100.0%
Minor Hardware*#	3,262	3,179	2,847	332	99.9%
Overhead Transformers*	408	397	355	42	100.0%
Reclosers*	0	0	0	0	0.0%
Sectionalizers*	0	0	0	0	0.0%
Switches	5	4	1	3	100.0%
Capacitors*	97	57	39	18	37.3%
Voltage Regulators	26	14	13	1	49.1%
UG Pad- Mounted Equipment**	1,510	883	883	0	47.0%
Network Vaults	27	27	0	27	100.0%
Manholes*	196	196	0	196	100.0%



Other Underground Structures***	8	8	0	8	100.0%
Streetlights	906	736	736	0	67.0%

\*Note: Because Ameren Missouri'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 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, jumpers, connectors, splices, terminations, 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.