Ameren Missouri 20 CSR 4240-23.020 Electrical Corporation Infrastructure Standards Annual Inspection Report for Calendar Year 2022

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 2022.

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 2022 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 2022:

Inspection Type	Inspections Scheduled	Inspections Completed	Inspections Not Completed
"Patrol"	138	138	0
"Detailed"	18	18	0
Ground Line	17	17	0

The results of the lines inspected are summarized as follows:

Table 2
Results of Inspections

Component	Number Inspected	Number Requiring Repairs	%
Wood Poles	3,146	39	1.2%
Wood Structures	12,374	212	1.7%
Non-Wood Structures	5,120	0	0.0%
Conductors*	17,494	3	0.02%
Insulators*	17,494	1	0.01%

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	2	2	100%	0	0.0%
Wood Structures	21	21	100%	0	0.0%
Non-Wood Structures	0	0	100%	0	0.0%
Conductors*	0	0	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
			2023	2024	Later	
Wood Poles*	37	37	37	0	0	94.9%
Wood Structures*	191	191	171	15	5	90.1%
Non-Wood Structures*	0	0	0	0	0	N/A%
Conductors*	3	3	3	0	0	100%
Insulators*	1	1	1	0	0	100%

Distribution System Inspections

Ameren Missouri conducted inspections on its Distribution System during calendar year 2022 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 2022

Table 5

Inspection	Inspection Units	Inspections Scheduled	Inspections Completed	Inspections Not Completed
Overhead Visual *	Circuit	320	320	0
Overhead Ground Line *	Circuit	194	194	0
Capacitors	Equipment	1,203	1,203	0
Voltage Regulators	Equipment	580	580	0
Underground Patrol	Circuit	219	219	0
Underground Detailed	Circuit	225	225	0
Network Vaults ^	Equipment	120	62	58
Manholes #	Equipment	1,577	1,576	1
Other Underground Structures	Equipment	99	99	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: Syncing issues with technology caused significant delays during the 2021 inspections. The syncing issue was resolved in 2022 whereby the 2021 inspections were completed. This caused a subsequent delay in the 2022 inspection timeline. The 58 remaining 2022 inspections are scheduled to be complete by 10/1/2023.

Note: Debris from a nearby building fire covered one of the manholes scheduled to be inspected. Crews are still working to clear debris to access the manhole. Inspection is scheduled to be complete in 2023.

The results of the inspections are summarized as follows:

Table 6
Results of Inspections

Component	Number Inspected	Number Requiring Repairs	Percentage
Poles/Towers*	170,855	2,034	1.19%
Anchors*	170,855	46	0.03%
Conductors*	170,855	256	0.15%
Crossarm Braces*	170,855	466	0.27%
Crossarms*	170,855	2,021	1.18%
Fuses*	170,855	19	0.01%
Grounding*	170,855	1,159	0.68%
Guy Wires*	170,855	1,239	0.73%
Insulators*	170,855	1,046	0.61%
Lightning Arresters*	170,855	366	0.21%
Minor Hardware*#	170,855	1,402	0.82%
Overhead Transformers*	170,855	65	0.04%
Reclosers*	170,855	0	0.00%
Sectionalizers*	170,855	0	0.00%
Switches	170,855	11	0.01%
Capacitors*	1,203	214	17.79%
Voltage Regulators	580	27	4.66%
UG Pad-Mounted Equipment**	39,471	2,983	7.56%
Network Vaults	62	45	72.58%
Manholes*	1,576	207	13.13%
Other Underground Structures***	99	0	0.00%
Streetlights	24,399	794	3.25%

*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*	91	91	100%	0	0.00%
Anchors*	0	0	N/A	0	0.00%
Conductors*	0	0	N/A	0	0.00%
Crossarm Braces*	0	0	N/A	0	0.00%
Crossarms*	0	0	N/A	0	0.00%
Fuses*	0	0	N/A	0	0.00%
Grounding*	0	0	N/A	0	0.00%
Guy Wires*	0	0	N/A	0	0.00%
Insulators*	0	0	N/A	0	0.00%
Lightning Arresters*	0	0	N/A	0	0.00%
Minor Hardware*#	0	0	N/A	0	0.00%
Overhead Transformers*	0	0	N/A	0	0.00%
Reclosers*	0	0	N/A	0	0.00%
Sectionalizers*	0	0	N/A	0	0.00%
Switches	0	0	N/A	0	0.00%
Capacitors*	128	128	100%	0	0.00%
Voltage Regulators	12	12	100%	0	0.00%
UG Pad-Mounted Equipment**	52	52	100%	0	0.00%
Network Vaults	0	0	N/A	0	0.00%
Manholes*	0	0	N/A	0	0.00%
Other Underground Structures***	0	0	N/A	0	0.00%
Streetlights	636	636	100%	0	0.00%

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 2023	Corrective Action Scheduled Later	Percent of Equipment in Need of Corrective Action but with a Scheduled Date Beyond the Reporting Period
Poles/Towers*	1,943	1,734	1,630	104	95.5%
Anchors*	46	46	45	1	100.0%
Conductors*	256	254	241	13	100.0%
Crossarm Braces*	466	465	452	13	100.0%
Crossarms*	2,021	2,017	2,002	15	100.0%
Fuses*	19	19	18	1	100.0%
Grounding*	1,159	1,144	1,031	13	100.0%
Guy Wires*	1,239	1,223	1,134	89	100.0%
Insulators*	1,046	1,041	1,027	14	100.0%
Lightning Arresters*	366	361	316	45	100.0%
Minor Hardware*#	1,402	1,389	1,302	87	100.0%
Overhead Transformers*	65	64	63	1	100.0%
Reclosers*	0	0	0	0	0.0%
Sectionalizers*	0	0	0	0	0.0%
Switches	11	11	10	1	100.0%
Capacitors*	86	74	74	0	40.2%
Voltage Regulators	15	14	14	0	55.6%
UG Pad-Mounted Equipment**	2,930	2,636	2,267	369	98.2%
Network Vaults	45	45	0	45	100.0%
Manholes*	207	207	0	207	100.0%
Other Underground Structures***	0	0	0	0	N/A
Streetlights	154	50	43	7	19.4%

*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.