

**2017 Reliability Compliance Report
Submitted to Missouri Public Service Commission**



Liberty Utilities®
EMPIRE DISTRICT

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Introduction

The Empire District Electric Company's ("Empire") system reliability department and maintenance program comply with requirements of Missouri's Electrical Infrastructure Standards 4 CSR 240-23.020. The system reliability department is in its ninth full year of operation and continues to improve the process of managing infrastructure inspections, corrective action monitoring, data management and reporting necessary to comply with 4 CSR 240-23.020. Empire anticipates the infrastructure inspection program will continue to evolve in order to streamline the inspection processes, data collection, maintenance crew collaboration, and reporting documentation.

Osmose Utility Services, Inc. (Osmose) is currently contracted to perform infrastructure inspections on Empire facilities. They have been inspecting Empire facilities since 2008. Empire utilizes its own personnel to perform detail inspections on padmounted equipment, three-phase reclosers, capacitors, and regulators. Empire contracted with Hot Shot Services, Inc. (Hot Shot) to perform an annual aerial patrol inspection of the transmission system and an infrared inspection of equipment on the transmission system. Empire also utilizes a work management software solution (Maximo) to maintain records and track the progress associated with the infrastructure inspections and corrective actions.

Compliance Statement

Empire has complied with the rules established in the State of Missouri's Electrical Corporation Infrastructure Standards, 4 CSR 240.23-020 for the 2017 calendar year.

2017 Inspection Plan Summary

Distribution

Empire completed patrol inspections on 47,508 overhead components, 4,278 streetlight components and 4,953 underground components in 2017 using the services of Osmose. Empire completed detail inspections on 40,866 overhead components and 2,861 streetlight components using the services of Osmose. Empire completed detail inspections on 2,800 underground components in 2017 using Empire's own personnel. Empire completed 12,466 intrusive inspections in 2017 using the services of Osmose.

Distribution 2017 Inspection Plan Summary					
Inspection Type	Facility Type	Components	Inspections Planned for 2017	Inspections Completed During 2017	Inspections Not Completed in 2017
Patrol	Overhead Circuits, Structures, & Equipment	Poles, Transformers, Capacitors, Regulators, Reclosers, Switches	47,508	47,508	0
	Streetlight System	Structures	4,278	4,278	0
	Underground Structures & Equipment	Sectionalizing Cabinets, Vaults, Transformers, Switches	5,075	4,953	122
Detail	Overhead Circuits, Structures, & Equipment	Poles, Transformers, Capacitors, Regulators, Reclosers, Switches	40,866	40,866	0
	Streetlight System	Structures	2,861	2,861	0
	Underground Structures & Equipment	Sectionalizing Cabinets, Vaults, Transformers, Switches	3,005	2,800	205
Intrusive	Wood Poles	Poles	12,466	12,466	0

Transmission

Empire completed an aerial patrol inspection on 15,285 poles out of the 15,285 poles that were planned using the services of Hot Shot Infrared Inspections. Using the services of Osmose, Empire completed 1,898 intrusive inspections. Empire did not perform transmission detail inspections in 2017. Empire's planned 3-year transmission detail inspection cycle allowed for flexibility in the management of inspections to ensure continued compliance while maintaining discretion of when the costs would be incurred. The planned 2017 pole inspections will be conducted in 2018. The inspection plan, as modified, will allow Empire to meet or exceed the required 6-year cycle. See the Transmission 2017 Inspection Corrective Plan Summary below for additional information.

Transmission 2017 Inspection Plan Summary					
Inspection Type	Facility Type	Components	Inspections Planned for 2017	Inspections Completed During 2017	Inspections Not Completed in 2017
Patrol	Overhead Structures & Equipment	Poles	15,285	15,285	0
Detail	Overhead Structures & Equipment	Poles, Switches	5,380	0	5,380
Intrusive	Overhead Structures & Equipment	Poles	1,898	1,898	0

Transmission 2017 Inspection Corrective Plan Summary				
Inspection Type	Facility Type	Components	Incomplete Inspections Planned for 2017	Inspections Planned for 2018
Detail	Overhead Structures & Equipment	Poles, Switches	5,380	5,380

2017 Work Order Rating Summary

Empire has developed a priority rating system to classify corrective actions and provide appropriate remediation schedules. The priority rating system allows Empire to balance its resources to remediate corrective actions in a timely and economical manner while improving the service reliability to its customers. Only items identified during the course

of infrastructure inspections will be rated using this system. A listing of the priority ratings description and corresponding scheduling period are detailed in the table below.

Priority Rating	Description	Corrective Action Scheduling Period
5	Emergency/Safety/Load Limiting/Customer Outage	Immediate
4	Urgent/May Affect Load	180 days
3	Time Critical/Seasonal	365 days
2	Routine/Non-Critical	365 days
1	Project/Operational Improvements	Empire's discretion

Distribution

Distribution 2017 Work Order Rating Summary							
Inspection Type	Facility Type	Components	Priority 5	Priority 4	Priority 3	Priority 2	Priority 1
Patrol	Overhead Circuits, Structures, & Equipment	Poles, Transformers, Capacitors, Regulators, Reclosers, Switches	0	123	0	2,219	11
	Underground Structures & Equipment	Sectionalizing Cabinets, Vaults, Transformers, Switches,	1	0	0	71	2
Detail	Overhead Circuits, Structures, & Equipment	Poles, Transformers, Capacitors, Regulators, Reclosers, Switches	1	57	0	1,394	1
	Underground Structures & Equipment	Sectionalizing Cabinets, Vaults, Transformers, Switches,	0	0	0	31	0
Intrusive	Wood Poles & Equipment	Poles	4	55	0	1,614	0

Transmission

Transmission 2017 Work Order Rating Summary							
Inspection Type	Facility Type	Components	Priority 5	Priority 4	Priority 3	Priority 2	Priority 1
Patrol	Overhead Structures & Equipment	Poles	1	8	0	81	0
Detail	Overhead Structures & Equipment	Poles & Switches	0	0	0	0	0
Intrusive	Overhead Structures & Equipment	Poles	0	0	0	123	0

2017 Corrective Action Summary

Distribution

Empire completed 2,955 work orders of the 3,642 that were planned in 2017. Another 276 work orders were completed in 2018. The remaining 411 work orders are planned to be completed by December 31, 2018.

Distribution 2017 Corrective Action Summary							
Inspection Type	Facility Type	Components	Corrective Action Planned in 2017	Corrective Action Completed in 2017	Corrective Action Incomplete in 2017	Corrective Action Completed in 2018	Corrective Action to Complete in 2018
Patrol	Overhead Circuits, Structures, & Equipment	Poles, Transformers, Capacitors, Regulators, Reclosers, Switches	1,264	782	482	128	354
	Underground Structures & Equipment	Sectionalizing Cabinets, Vaults, Transformers, Switches	109	92	17	17	0
Detail	Overhead Circuits, Structures, & Equipment	Poles, Transformers, Capacitors, Regulators, Reclosers, Switches	850	753	97	83	14

	Underground Structures & Equipment	Sectionalizing Cabinets, Vaults, Transformers, Switches	256	223	33	20	13
Intrusive	Wood Poles & Equipment	Poles	1,163	1,105	58	28	30

Transmission

Empire completed 66 work orders of the 258 that were planned in 2017. Another 99 work orders were completed in 2018. The remaining 93 work orders are planned to be completed by December 31, 2018.

Transmission 2017 Corrective Action Summary							
Inspection Type	Facility Type	Components	Corrective Action Planned in 2017	Corrective Action Completed in 2017	Corrective Action Incomplete in 2017	Corrective Action Completed in 2018	Corrective Action to Complete in 2018
Patrol	Overhead Structures & Equipment	Poles	90	0	90	33	57
Detail	Overhead Structures & Equipment	Poles & Switches	105	26	79	57	22
Intrusive	Overhead Structures & Equipment	Poles	63	40	23	9	14