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June 30, 2023

Energy Department
Missouri Public Service Commission
200 Madison Street, PO Box 360
Jefferson City, MO 65102-0360

RE: Reliability Compliance Report

The Empire District Electric Company d/b/a Liberty ("Liberty") respectfully submits its annual reliability compliance report. Pursuant to Commission Rule 20 CSR 4240-23.020(3)(C), Liberty's attached Reliability Compliance Report discusses the 2022 infrastructure activities and planned 2023 activities to maintain or improve service reliability for Liberty's electric customers. Please note that this is a working document, the planned activities are subject to change especially given the continuing supply chain constraints.

Respectfully submitted,

Sam McGarrah
Director, Planning and Asset Management



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Section 1:

Introduction

The system reliability department and maintenance program for The Empire District Electric Company (“Liberty” or “Company”) comply with the requirements of the Missouri Public Service Commission’s Electrical Corporation Infrastructure Standards, Rule 20 CSR 4240-23.020. The system reliability department is in its fourteenth 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 20 CSR 4240-23.020. Liberty is continually evaluating the infrastructure inspection program as the Company streamlines the inspection processes, data collection, maintenance crew collaboration, and reporting documentation.

Osmose Utility Services, Inc. (“Osmose”) is currently contracted to perform infrastructure inspections on Liberty facilities. They have been inspecting Liberty facilities since 2008.

Liberty utilizes employees to perform detail inspections on padmounted equipment, three-phase reclosers, capacitors, and regulators.

Liberty has contracted Hot/Shot Infrared Inspections, Inc. (“Hot Shot”) to perform an annual aerial patrol inspection of the transmission system and an infrared inspection of equipment on the transmission system.

Liberty also utilizes Maximo, a work management software solution to maintain records and track the progress associated with the infrastructure inspections and corrective actions.

Compliance Statement

Liberty’s 2022 calendar year reliability compliance report was prepared pursuant to and is in compliance with the Commission’s Electrical Corporation Infrastructure Standards, 20 CSR 4240-23.020.



Section 2:

2022 Distribution Inspection Plan Summary

Patrol Inspections:

As outlined in the table below, Liberty completed Patrol Inspections on 20,389 Overhead components and 1,276 Streetlight components, utilizing the services of Osmose. The Company also completed 1,644 underground components in 2022 utilizing Osmose personnel.

As of December 31, 2022, the Company's contractor, Osmose, was unable to complete 102 inspections of overhead components and 915 underground structures or equipment. Osmose experienced significant employee retention issues during 2022 which impacted their ability to complete scheduled inspections. However, the incomplete inspections were performed and completed by January 31, 2023.

Detail Inspections:

Utilizing the services of Osmose, the Company completed 24,243 Detail Inspections on Overhead components and 2,095 Streetlight components. In addition, Liberty completed Detail Inspections on 1,929 Underground components utilizing Osmose and internal personnel.

As of December 31, 2022, the Company's contractor, Osmose, was unable to complete 132 inspections of overhead components. Osmose experienced significant employee retention issues during 2022 which impacted their ability to complete scheduled inspections. However, the incomplete inspections were performed and completed by January 31, 2023.

Intrusive Inspections:

Utilizing the services of Osmose, the Company completed 17,370 intrusive pole inspections in 2022. As of December 31, 2022, two distribution intrusive inspections (3,985 poles) were not completed by the Company's contractor, Osmose, as originally scheduled. Osmose experienced significant employee retention issues during 2022 which impacted their ability to complete scheduled inspections. However, these inspections were completed by January 31, 2023.



Plan Deviations:

One distribution patrol inspection (102 poles), one distribution detail inspection (132 poles), two distribution underground patrol (915 structures or equipment), and two distribution intrusive inspections (3,985 poles) were not completed in 2022 as originally scheduled. As mentioned above, Osmose's ability to complete scheduled inspections was significantly impaired by their employee retention issues experienced during 2022. However, the incomplete inspections were all performed and completed by January 31, 2023. Liberty has worked closely with Osmose to develop improved resource scheduling in an effort to prevent future issues.

2022 Distribution Inspection Plan Summary					
Inspection Type	Facility Type	Components	Inspections Planned for 2022	Inspections Completed During 2022	Inspections Not Completed in 2022
Patrol	Overhead Circuits, Structures, & Equipment	Poles, Transformers, Capacitors, Regulators, Reclosers, Switches	20,491	20,389	102
	Streetlight System	Structures	1,276	1,276	0
	Underground Structures & Equipment	Sectionalizing Cabinets, Vaults, Transformers, Switches	2,559	1,644	915
Detail	Overhead Circuits, Structures, & Equipment	Poles, Transformers, Capacitors, Regulators, Reclosers, Switches	24,375	24,243	132
	Streetlight System	Structures	2,095	2,095	0
	Underground Structures & Equipment	Sectionalizing Cabinets, Vaults, Transformers, Switches	1,929	1,929	0
Intrusive	Wood Poles	Poles	21,355	17,370	3,985



2022 Transmission Inspection Plan Summary

Patrol Inspections:

Liberty completed an aerial Patrol Inspection on 15,433 overhead components using the services of Hot/Shot Infrared Inspections.

Detail Inspections:

Utilizing the services of Osmose, the Company completed 2,003 Detail Inspections on overhead components.

Intrusive Inspections:

Utilizing the services of Osmose, the Company completed 1,583 Intrusive Inspections.

Plan Deviations:

All transmission inspections were performed as expected and completed in 2022.

2022 Transmission Inspection Plan Summary					
Inspection Type	Facility Type	Components	Inspections Planned for 2022	Inspections Completed During 2022	Inspections Not Completed in 2022
Patrol	Overhead Structures & Equipment	Poles	15,433	15,433	0
Detail	Overhead Structures & Equipment	Poles, Switches	2,003	2,003	0
Intrusive	Overhead Structures & Equipment	Poles	1,583	1,583	0

**Section 3:****Work Order Rating Summary**

Liberty has developed a priority rating system to classify corrective actions and provide appropriate remediation schedules. The priority rating system allows Liberty 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	Liberty's Discretion



2022 Distribution Work Order Rating

2022 Distribution 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	1	220	0	3,470	1
	Underground Structures & Equipment	Sectionalizing Cabinets, Vaults, Transformers, Switches	0	1	0	124	36
Detail	Overhead Circuits, Structures, & Equipment	Poles, Transformers, Capacitors, Regulators, Reclosers, Switches	2	261	0	2,399	109
	Underground Structures & Equipment	Sectionalizing Cabinets, Vaults, Transformers, Switches,	1	6	0	77	66
Intrusive	Wood Poles & Equipment	Poles	3	30	0	1,594	0

2022 Distribution Work Order Rating Summary - Percentage



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%	6%	0%	94%	0%
	Underground Structures & Equipment	Sectionalizing Cabinets, Vaults, Transformers, Switches,	0%	1%	0%	77%	22%
Detail	Overhead Circuits, Structures, & Equipment	Poles, Transformers, Capacitors, Regulators, Reclosers, Switches	0%	9%	0%	87%	4%
	Underground Structures & Equipment	Sectionalizing Cabinets, Vaults, Transformers, Switches,	1%	4%	0%	51%	44%
Intrusive	Wood Poles & Equipment	Poles	0%	2%	0%	98%	0%



2022 Transmission Work Order Rating

2022 Transmission Work Order Rating Summary							
Inspection Type	Facility Type	Components	Priority 5	Priority 4	Priority 3	Priority 2	Priority 1
Patrol	Overhead Structures & Equipment	Poles	0	0	0	9	0
Detail	Overhead Structures & Equipment	Poles & Switches	0	31	0	121	0
Intrusive	Overhead Structures & Equipment	Poles	26	35	0	120	0

2022 Transmission Work Order Rating Summary – Percentage							
Inspection Type	Facility Type	Components	Priority 5	Priority 4	Priority 3	Priority 2	Priority 1
Patrol	Overhead Structures & Equipment	Poles	0%	0%	0%	100%	0%
Detail	Overhead Structures & Equipment	Poles & Switches	0%	20%	0%	80%	0%
Intrusive	Overhead Structures & Equipment	Poles	14%	19%	0%	66%	0%



Section 4:

2022 Distribution Corrective Action

Liberty completed 5,136 distribution corrective actions of the 9,931 that were planned in 2022.

Planned corrective actions scheduled in 2022 are based on the priority rating system due dates.

As of the date of this report, another 910 corrective actions have been completed in 2023.

2022 Distribution Corrective Action Summary						
Inspection Type	Facility Type	Components	Corrective Action Planned in 2022	Corrective Action Completed in 2022	Corrective Action Incomplete in 2022	Corrective Action Completed in 2023
Patrol	Overhead Circuits, Structures, & Equipment	Poles, Transformers, Capacitors, Regulators, Reclosers, Switches	2,925	1,401	1,524	325
	Underground Structures & Equipment	Sectionalizing Cabinets, Vaults, Transformers, Switches	198	164	34	2
Detail	Overhead Circuits, Structures, & Equipment	Poles, Transformers, Capacitors, Regulators, Reclosers, Switches	3,726	2,057	1,669	319
	Underground Structures & Equipment	Sectionalizing Cabinets, Vaults, Transformers, Switches	518	344	174	6
Intrusive	Wood Poles & Equipment	Poles	2,564	1,170	1,394	258
Total			9,931	5,136	4,795	910



2022 Distribution Corrective Action Summary - Percentage						
Inspection Type	Facility Type	Components	Corrective Action Planned in 2022	Corrective Action Completed in 2022	Corrective Action Incomplete in 2022	Corrective Action Completed in 2023
Patrol	Overhead Circuits, Structures, & Equipment	Poles, Transformers, Capacitors, Regulators, Reclosers, Switches	2,925	48%	52%	11%
	Underground Structures & Equipment	Sectionalizing Cabinets, Vaults, Transformers, Switches	198	83%	17%	1%
Detail	Overhead Circuits, Structures, & Equipment	Poles, Transformers, Capacitors, Regulators, Reclosers, Switches	3,726	55%	45%	9%
	Underground Structures & Equipment	Sectionalizing Cabinets, Vaults, Transformers, Switches	518	66%	34%	1%
Intrusive	Wood Poles & Equipment	Poles	2,564	46%	54%	10%

Distribution Plan Deviations:



The Company's ability to complete corrective actions was previously impaired by retention issues experienced by the Company as related to its skilled workforce. Liberty, with approval of the Commission, addressed this issue by implementing the linemen retention incentive program.

Supply chain issues, likely because of the Covid-19 pandemic, created material constraints, resulting in a need to conserve existing material inventories. The supply chain issues impaired the company's ability to complete some of its planned corrective actions. The remaining 3,885 distribution corrective actions will be completed under a revised remediation plan based upon supply chain relief and material availability. Liberty has already completed 910 distribution corrective actions in 2023.



2022 Transmission Corrective Action

Liberty completed 669 transmission corrective actions of the 1,099 that were planned in 2022. As of the date of this report, another 93 corrective actions were completed in 2023.

2022 Transmission Corrective Action Summary						
Inspection Type	Facility Type	Components	Corrective Action Planned in 2022	Corrective Action Completed in 2022	Corrective Action Incomplete in 2022	Corrective Action Completed in 2023
Patrol	Overhead Structures & Equipment	Poles	334	241	93	16
Detail	Overhead Structures & Equipment	Poles & Switches	535	331	204	38
Intrusive	Overhead Structures & Equipment	Poles	230	97	133	39
Total			1,099	669	430	93

2022 Transmission Corrective Action Summary - Percentage						
Inspection Type	Facility Type	Components	Corrective Action Planned in 2022	Corrective Action Completed in 2022	Corrective Action Incomplete in 2022	Corrective Action Completed in 2023
Patrol	Overhead Structures & Equipment	Poles	334	72%	28%	5%
Detail	Overhead Structures & Equipment	Poles & Switches	535	62%	38%	7%
Intrusive	Overhead Structures & Equipment	Poles	230	42%	58%	17%

Transmission Plan Deviations:

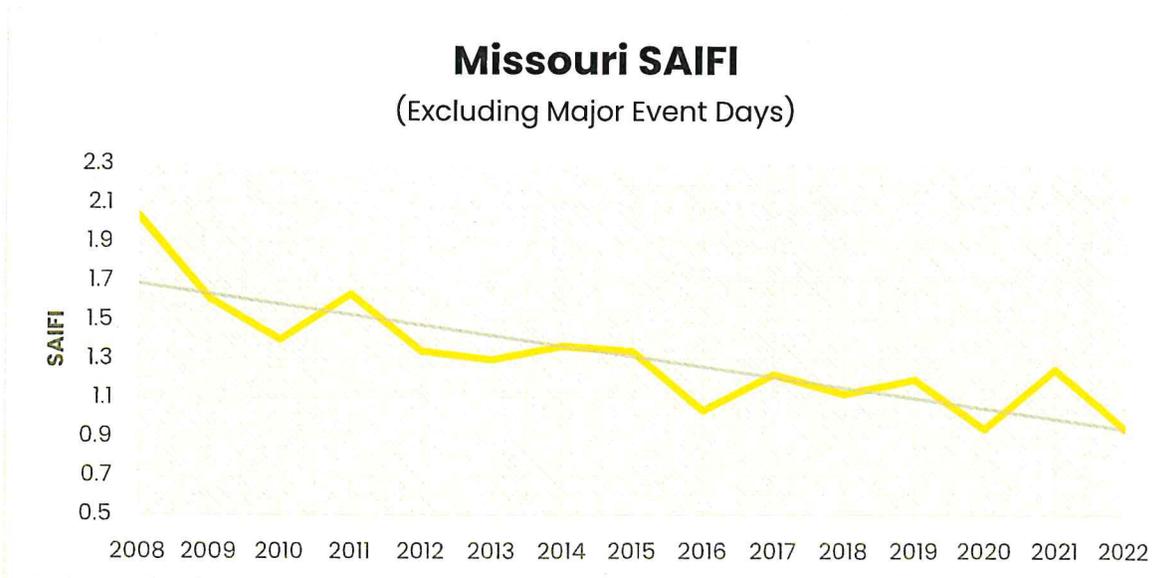


The Company’s ability to complete corrective actions was previously impaired by retention issues experienced by the Company as related to its skilled workforce. Liberty, with approval of the Commission, addressed this issue by implementing the linemen retention incentive program.

Supply chain issues, likely because of the Covid-19 pandemic, created material constraints resulting in a need to conserve existing material inventories. The supply chain issues impaired the company’s ability to complete corrective actions. The remaining 337 transmission corrective actions will be completed under a revised remediation plan based upon supply chain relief and material availability. Liberty has completed 93 transmission corrective actions in 2023.

Corrective Action Deviations

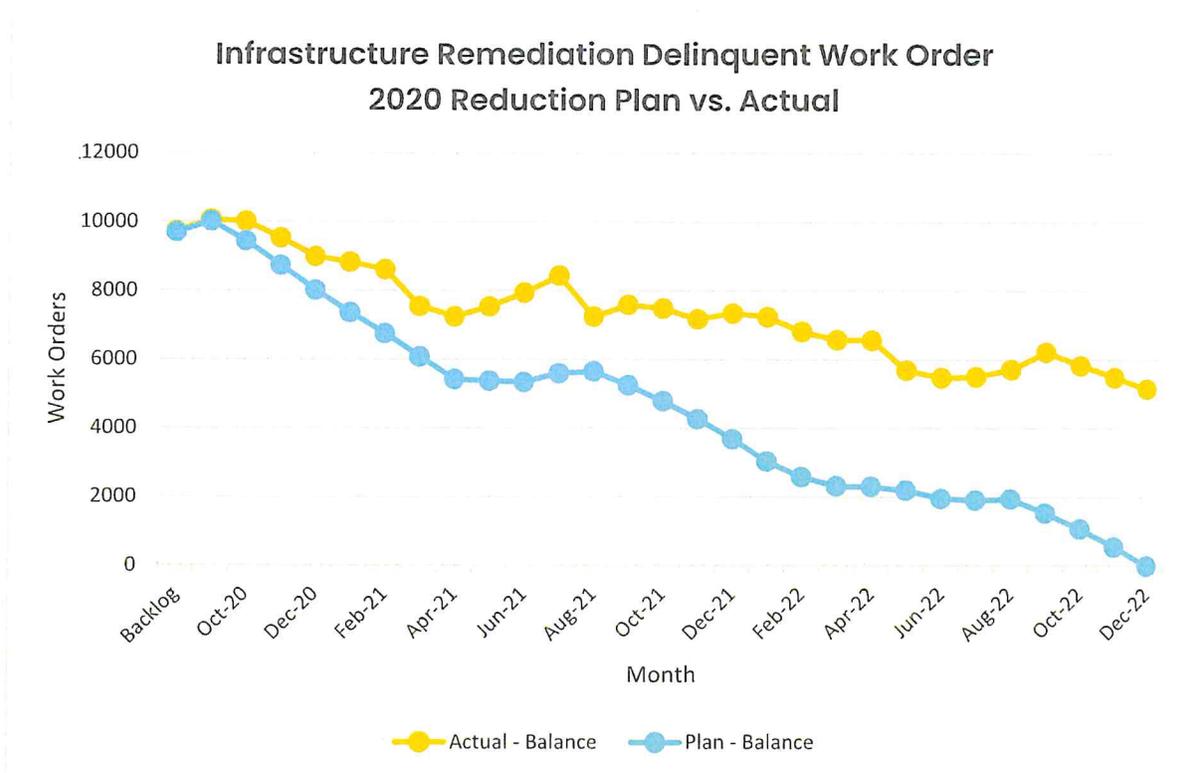
Liberty is committed to addressing any defects identified during inspections and recognizes the significant value of the inspection program to customers. Since the inception of Liberty’s reliability inspection program in 2008, Liberty’s customers have experienced a significant improvement in reliability. The average customer has experienced one less outage per year as observed by the 50% improvement in SAIFI performance between 2008 and 2022. A portion of the reliability improvement is attributable to the inspection program and its associated corrective actions.



In 2020, Liberty identified a significant number of corrective action work orders which were unresolved and developed a remediation plan to address the unresolved work. The plan optimistically established a target date of December 31, 2022 to resolve all of the 9,701 past due work orders. However, significant infrastructure construction due to new residential homes, commercial businesses, and other reliability improvement projects caused line personnel and



engineering labor issues to continue to disrupt the planned work in 2021. These issues carried into 2022 with the addition of supply chain issues such that Liberty had to reduce the remediation plan efforts to meet the needs of new customers. As can be seen by the graph, Liberty made significant reductions in the backlog even though the ultimate goal was not achieved. Liberty was able to complete 5,805 corrective action work orders in 2022. At the conclusion of 2022, Liberty had 5,147 unresolved work orders in the remediation plan.





Liberty is working to develop a revised remediation plan which accounts for current circumstances. While the supply chain issues are improving, Liberty continues to experience issues for some materials in 2023. Liberty has initially developed a 2023 remediation plan to address 4,128 work orders. Liberty is working to develop a revised remediation plan for future years.

While Liberty exerted significant effort to implement its current remediation plan, additional work became past due during the same period. Work identified during inspections ranges in complexity and effort required to perform remediation. Some items are simple and require minimal labor, such as guy markers needing installed or broken ground wires needing repaired. While other items are more complex and require significant effort, for example a pole replacement. Liberty strives to manage this work in an overall efficient manner while prioritizing items of greater urgency.

Liberty's current corrective actions are scheduled based on the priority rating system defined in Section 3 however the existing schedule does not allow for consideration of other projects. The existing priority ratings do not account for projects impacting a circuit, efficient utilization of remediation to perform line rebuilds to improve reliability, and scheduling around other system projects. For future remediation, Liberty is considering an alternative priority schedule to better accommodate these other considerations.

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