

**BEFORE THE CORPORATION COMMISSION OF THE STATE OF OKLAHOMA**

APPLICATION OF THE EMPIRE DISTRICT )  
ELECTRIC COMPANY, A KANSAS )  
CORPORATION, FOR AN ADJUSTMENT IN ITS )  
RATES AND CHARGES FOR ELECTRIC SERVICE )  
IN THE STATE OF OKLAHOMA )

CAUSE NO. PUD 202100163

**FILED**  
FEB 28 2022

COURT CLERK'S OFFICE - OKC  
CORPORATION COMMISSION  
OF OKLAHOMA

**Direct Testimony**

**of**

**Jeffery Westfall**

**Submitted on behalf of**

**The Empire District Electric Company**

**February 28, 2022**



TABLE OF CONTENTS  
FOR THE DIRECT TESTIMONY OF JEFFERY WESTFALL  
THE EMPIRE DISTRICT ELECTRIC COMPANY  
BEFORE THE CORPORATION COMMISSION OF THE STATE OF OKLAHOMA  
CAUSE NO. PUD 202100163

<b>SUBJECT</b>	<b>PAGE</b>
I. INTRODUCTION .....	1
II. TRANSMISSION AND DISTRIBUTION CAPITAL INVESTMENTS.....	3
III. OTHER IMPROVEMENTS TO SYSTEM RELIABILITY .....	8
IV. CONCLUSION.....	13

**LIST OF EXHIBITS IN SUPPORT OF DIRECT TESTIMONY**

1.	JW-1 Transmission and Distribution Plant Additions Since Prior Case
2.	JW-2 Maps

DIRECT TESTIMONY OF JEFFERY WESTFALL  
THE EMPIRE DISTRICT ELECTRIC COMPANY  
BEFORE THE CORPORATION COMMISSION OF THE STATE OF OKLAHOMA  
CAUSE NO. PUD 202100163

1 **I. INTRODUCTION**

2 **Q. Please state your name and business address.**

3 A. My name is Jeffery Westfall, and my business address is 602 S. Joplin Ave, Joplin, MO  
4 64801

5 **Q. By whom are you employed and in what capacity?**

6 A. I am employed by Liberty Utilities Service Corp, (“LUSC”) as the Central Region  
7 Director of Electric Operations – T&D (Transmission & Distribution). My primary  
8 responsibilities include line and substation transmission and distribution operations,  
9 reliability, vegetation, dispatch and meter shop.

10 **Q. On whose behalf are you testifying in this proceeding?**

11 A. I am testifying on behalf of The Empire District Electric Company (“Liberty-Empire”  
12 or “Company”).

13 **Q. Please describe your educational and professional background.**

14 A. I began my employment with Liberty-Empire in December of 1989 in the Building  
15 Services department as a night janitor, switchboard operator and mail clerk. In August  
16 1990, I became a warehouseman in the Company’s Stores department. In March of  
17 1991, I transferred to the Asbury power plant where I held the position of Labor and  
18 Labor semi-skilled. I accepted the position of groundman in Aurora, MO in March of  
19 1992. I progressed in classification and obtained my Journeyman Lineman status in  
20 June of 1995, which I held until I was named Manager of Line Operations in July 2008.  
21 As the Manager of Line Operations, I oversaw the line operations for the Aurora, MO

1 service area, which included managing the workload and outage response for 4-line  
2 crews and 3 service trucks. In addition, I was responsible for the Construction and  
3 Maintenance budgets for the Aurora area. In June of 2015, I accepted the position of  
4 Director of Operations – East where my responsibilities were expanded to include our  
5 4 operating areas on the east side of Liberty-Empire's electric service area. In October  
6 of 2016, I was promoted to Director of Operations and my responsibility was expanded  
7 to include all 8 of the operating service areas. Finally, in October of 2017, I was named  
8 the Central Region Director of Operations – T&D.

9 **Q. Have you previously testified in a proceeding before the Oklahoma Corporation**  
10 **Commission (“Commission”) or before any other utility regulatory agency?**

11 A. Yes, I have provided testimony on behalf of the Company before the Oklahoma  
12 Corporation Commission in Cause No. PUD 201800133 and the Missouri Public  
13 Service Commission in Case Numbers ER-2019-0374 and ER-2021-0312.

14 **Q. What is the purpose of your Direct Testimony in this proceeding?**

15 A. My testimony provides an overview of the transmission and distribution investments  
16 made by Liberty-Empire since our last rate case in Oklahoma to increase reliability for  
17 our customers and improve system operability and safety. I also provide examples of  
18 the Company’s strategy to proactively mitigate outage risk by replacing equipment  
19 found to be in poor, end of service life, or otherwise non-conforming condition based  
20 on objective evidence collected through field inspections. For instance, solutions that  
21 increase sectionalization of our transmission and distribution system, including adding  
22 fuses and substation breakers, help reduce the number of customers impacted by  
23 outages when they do occur and enable faster restoration times. Construction of new  
24 substations and reconductoring projects also provide additional system redundancy and

1 switching paths, to make the system more operable under a variety of normal operating  
2 conditions and weather events. Replacing aging and deteriorating infrastructure is a key  
3 component of assuring that we can continue to provide safe reliable service for our  
4 customers. The results of these investments are evident from the system's relatively  
5 strong performance during the recent extreme weather events in our service area. I will  
6 also discuss the Company's system reliability metrics and efforts made by Liberty-  
7 Empire to improve service reliability and service quality for our customers in  
8 Oklahoma.

9 **II. TRANSMISSION AND DISTRIBUTION CAPITAL INVESTMENTS**

10 **Q. What capital investments in the transmission and distribution system have been**  
11 **made since Liberty-Empire's last general rate case?**

12 A. The Company continually seeks to reinvest in infrastructure to ensure that its  
13 transmission and distribution systems are providing reliable and adequate service to  
14 customers. I have prepared a list of capital investments in excess of \$1 million made in  
15 Liberty-Empire's transmission and distribution systems since April 1, 2019, through  
16 the end of the update period in this case, December 31, 2021. This list includes a  
17 description and justification for each capital project and is attached to my testimony as  
18 Direct Exhibit JW-1.

19 **Q. Why does Liberty-Empire invest in projects on transmission and distribution**  
20 **systems?**

21 A. There are many reasons underlying transmission and distribution reinforcements – these  
22 reasons are driven by standard compliance, past reliability data, load growth  
23 accommodation, and the results of field inspections. A common theme across all  
24 investment drivers is the Company's commitment to maintain and improve the

1 reliability of the grid. More specifically, the Company’s transmission and distribution  
2 investments seek to perform the following functions:

- 3 • sectionalize the existing circuits to quickly and efficiently reduce the number  
4 of customers affected by outages by restoring the service to adjacent areas  
5 through alternate supply paths;
- 6 • harden the system and make it more resilient to extreme weather events by  
7 replacing deteriorated assets with reduced mechanical strength, reducing line  
8 sag, trimming adjacent vegetation, etc.;
- 9 • upgrade system voltages by reconductoring existing circuits and replacing older  
10 station assets with higher-rated equipment to enable load growth, reduce system  
11 losses and increase line transfer capability during the times of high loading;
- 12 • comply with relevant North American Reliability Corporation (“NERC”)  
13 standards and directives of the Southwest Power Pool (“SPP”) associated with  
14 system capacity, redundancies, and other priorities;
- 15 • undertake reactive repairs to line and station assets caused by weather, faulty  
16 equipment and other common outage causes;
- 17 • replacing or refurbishing deteriorated or obsolete station equipment no longer  
18 deemed to be operable as a result of inspections; and
- 19 • other types of proactive and reactive work associated with transmission and  
20 distribution infrastructure and supporting equipment and facilities.

21 **Q. Please describe the major initiative taken by the Company to make improvements**  
22 **to advance its system reliability?**

23 A. In 2010, Liberty-Empire developed Operation Toughen Up (“OTU”), which was  
24 originally scheduled for completion in 2021. Operation Toughen Up is a multi-year

1 plan to construct system improvements to advance reliability of the total system. The  
2 Operation Toughen Up program is nearing its end but has been extended through 2025.  
3 Liberty-Empire continues to examine the reliability of its transmission and distribution  
4 system to identify reliability deficiencies or system resiliency risks.

5 **Q. Please describe the Distribution and Transmission investments made by Liberty-**  
6 **Empire since the last case including OTU and other investments.**

7 A. The Company has made been significant investments in our Distribution and  
8 Transmission system since the last rate case. Direct Exhibit JW-1 provides a detailed  
9 list of all transmission and distribution investments over one million dollars made since  
10 the last rate. In addition, below are some specific examples of the Oklahoma  
11 distribution and other transmission investments constructed since the last rate case.

12 **Distribution:**

13 **DR0918 - Quapaw Reconductor** (Completed 2020), Reconductor approximately (3)  
14 miles of existing deteriorated single phase overhead #6 and 1/0 ACSR. This project  
15 sought to mitigate compromised SAIFI and SAIDI indices in the area.

16 **Transmission:**

17 **TA0928 - Install (3) 161kV Breakers and (1) 12kV Breaker at Purcell #421**  
18 (Completed 2020), sectionalized the 161kV line, improved protection of the substation  
19 transformer and added Supervisory Control and Data Acquisition (SCADA) to the  
20 substation to enable certain remote sensing and operation capabilities.

21 **TA0935 - Install 2-Way Transfer Scheme & Replace (3) 12kV Breakers at**  
22 **Monett H.T. #152** (Completed 2020), sectionalized the 69kV line and added SCADA  
23 capabilities to the substation.



1           **TA0943 - Install Auto-Transfer Scheme at Racine Junction** (Completed  
2           2020), sectionalized the 69kV line and provided automatic restoration capability by  
3           installing an auto recloser device capable of automatically clearing faults on a radial  
4           transmission tap serving Seneca, Missouri.

5           **TR0152 – Installing Optical Groundwire (OPGW) on 161kV Neosho to**  
6           **Noel/TR0154 OPGW on 161kV Noel to Decatur** (Completed 2020), This multi-  
7           phase project will replace all aged wood structures to adhere to NESC Grade B  
8           construction standards. The project will also leverage the scope economies created by  
9           pole replacements to install OPGW on the existing 161kV line segment from Neosho  
10          to #435 to Decatur South #392 to Flint Creek to improve network communications and  
11          thus help support system reliability and operability. There are currently no  
12          communications to the areas south of the Neosho area which inhibits the Company's  
13          ability to properly clear transmission line faults remotely or obtain loading and other  
14          operating data during system reliability events.

15          **TR0901** (Multi-phase project with final phase completed 2020) - This specific  
16          project spanned multiple years by design to minimize impacts to customers due to the  
17          radial configuration of this area in the Liberty-Empire service territory. The existing  
18          configuration was a radially fed 34.5kV system which was antiquated both in design  
19          configuration and in the operative voltage. The western portion of EDE 34.5kV was  
20          one of two remaining areas in which this voltage is utilized. Due to lack of available  
21          parts, spare equipment maintained for contingency response, and lack of available  
22          capacity availability coupled with age and design of existing infrastructure justified the  
23          conversion project. Working alongside other utilities for long range planning  
24          considerations further substantiated a conversion project so that future interconnection

1 projects could be pursued should further gains to reliability be pursued. The project  
2 initially included a rebuild of the transmission line from 34.5kV spacing to 115kV  
3 spacing as well as a vertical configuration. Including a higher insulation level and  
4 conductor configuration greatly improved the lightning protective envelope and  
5 eliminated conductor mid-span spacing concerns, which also resulted in a much more  
6 robust structure design. All aspects were to increase reliability to a radial system,  
7 regardless of final design voltage. This rebuild project was required to be completed  
8 in previous years to establish the platform on which the final conversion steps could  
9 springboard into production. Once this aspect of the project was realized, the design  
10 and specification of the final two steps were further refined. The next two steps  
11 included: firstly, substation conversions & secondly, standardization of  
12 voltage/equipment, both of which coopted Liberty-Empire spares equipment strategy.  
13 The following list is not in chronological order of implementation but is a brief  
14 summary of activities included in the two conversion steps. A new substation was built  
15 across the existing Sub #271 site. The new sub included a four position 69kV ring bus  
16 with updated protection packages in a new relay enclosure. Aged equipment was  
17 retired, and original Sub #271 site was retained for storage of material to expedite  
18 restoration efforts to the radial system(s). At Chetopa Sub #299, rebuilding of high-  
19 side structures was needed due to existing clearance concerns, replacement of existing  
20 transformer (age and high-side voltage driven), bus work rebuilds (spacing), and  
21 replacement of distribution breakers (low-side voltage and interrupt rating). In  
22 addition, the 12kV low-side voltage was used to standardize the station transformer  
23 specification (spares strategy) and for service to the Twin Valley #388 offtake. This  
24 option was selected in lieu of a full substation rebuild (spares strategy). The final step

1 was the conversion of Welch #186. The scope was minor due to preemptive actions  
2 taken by Liberty-Empire to prepare by way of dual high-side voltage windings. High-  
3 side fusing and transformer taps were changed, and sub re-energized with new  
4 transmission voltage.

5 **TR0910** (multiphase project all but one phase completed in 2021)- This is a  
6 project to rebuild 69kV transmission line at 33-0 from Sub #614 to Sub #400, Boston  
7 Sub #249 to Golden City Sub #251, Golden City Sub #251 to Boston Sub #400 and  
8 install automated switch at Boston Sub #400. This line needs to be upgraded to meet  
9 NESC Grade B construction and mitigate the vulnerability and integrity of line and  
10 structures due to the average age of line being around 70+ years. The automated switch  
11 allows for better sectionalizing and faster restore times in the event of outages which  
12 will improve reliability indices.

13 **III. OTHER IMPROVEMENTS TO SYSTEM RELIABILITY**

14 **Q. Are there other recent projects that the Company has invested in that are not**  
15 **included in this case?**

16 A. Yes. For example, in the last several years there has been an expansion of industrial  
17 farming in a portion of our Oklahoma service area which required a reconductor in  
18 order to provide proper voltage support for load growth. Project DR0237 –  
19 Reconductor Distribution Circuit 377-2, Reconductor of Circuit 377-2 from Sub #377  
20 Quapaw was originally constructed to serve rural residential and agricultural customers  
21 east of Quapaw, OK. The reconductor project consisted of replacing 23,550 feet of  
22 linear three-phase conductor cable and installation of 336 MCM ACSR overhead  
23 conductor. Approximately (50) poles and (70) fixtures were replaced to provide proper

1 support for the larger phase conductors as well as to replace deteriorated wood  
2 components due to age, decay, and wildlife damage.

3 **Q. Is the Company seeking recovery of this project?**

4 A. No, the project is scheduled to go into service later in 2022, outside of the update period  
5 of this rate case. Similar to other projects that fall outside of the update period the  
6 Company will not seek to recover these costs until it files its next rate case in  
7 Oklahoma.

8 **Q. In addition to the above mentioned projects and programs, what other efforts  
9 have contributed to improve system reliability?**

10 A. The Missouri Public Service Commission (“PSC”) implemented reliability inspection  
11 standards in 2008 which provide a more detailed inspection program than the  
12 Oklahoma inspection requirements in regards to the frequency and thoroughness of  
13 system inspections and repairs. Since the implementation of the Missouri standards,  
14 Liberty-Empire has chosen to implement similar standards for inspections and repairs  
15 for facilities in all jurisdictions served by Liberty-Empire. Liberty-Empire performs  
16 routine scheduled inspections and vegetation clearing to maintain the reliability of  
17 transmission and distribution circuits. Since the inception of these standards, over  
18 148,000 poles were subjected to a pole ground-line (intrusive) inspection (excavate and  
19 drill the pole to determine the condition of the pole), over 466,000 poles and devices  
20 were subjected to a detailed inspection (visual inspection which includes infrared  
21 inspection of pole-mount and pad-mount equipment) and over 593,000 poles and  
22 devices were subjected to a patrol inspection (visual inspection). In the past 5 years  
23 because of these inspections, over 6,400 poles and devices have been replaced. In  
24 addition to the inspections, Liberty-Empire also monitors reliability information on a

1 monthly basis to determine if there are trends in reliability statistics which indicate a  
2 need for further investigation.

3 **Q. Has the inspection standards performed by the Company resulted in remediation**  
4 **efforts that have improved Oklahoma reliability?**

5 A. Yes. Liberty-Empire performed 76 maintenance work orders and replaced 221 poles  
6 and devices in the Oklahoma service areas from April 1, 2019 through December 31,  
7 2021.

8 **Q. Please describe the Wildlife Guarding Program implemented by Liberty-Empire?**

9 A. The Wildlife Guarding Program is an initiative to install wildlife guarding on Liberty-  
10 Empire distribution and transmission equipment. The program identifies locations  
11 where wildlife related outages have occurred and directs crews to install wildlife guards  
12 on equipment where needed. The guards insulate energized portions of the equipment  
13 which are frequently contacted by wildlife such as squirrels, snakes or birds. The  
14 guards reduce the number of wildlife related outages and improve service reliability.

15 **Q. What specific Oklahoma locations and devices were included in this initiative?**

16 A. Liberty-Empire covered approximately 164 transformers in our Oklahoma service area.  
17 27 transformers on circuit 3632, 80 transformers on circuit 3811 and 57 transformers  
18 on circuit 3812. The Company covered five Worst Performing Devices (“WPD”s)  
19 defined as any device with two or more animal related outages within the last 30 months  
20 for the scope of the program and some adjacent structures depending on vulnerability  
21 and previous outage data. Circuits 3811 and 3812 serve the towns of Commerce,  
22 Oklahoma and 3632 serves our customers located to the north and northwest of the  
23 town of Fairland, Oklahoma. For a map of the initiative refer to Direct Exhibit JW-2.

1 **Q. Has Liberty-Empire seen improvements in reliability as a result of these**  
2 **investments?**

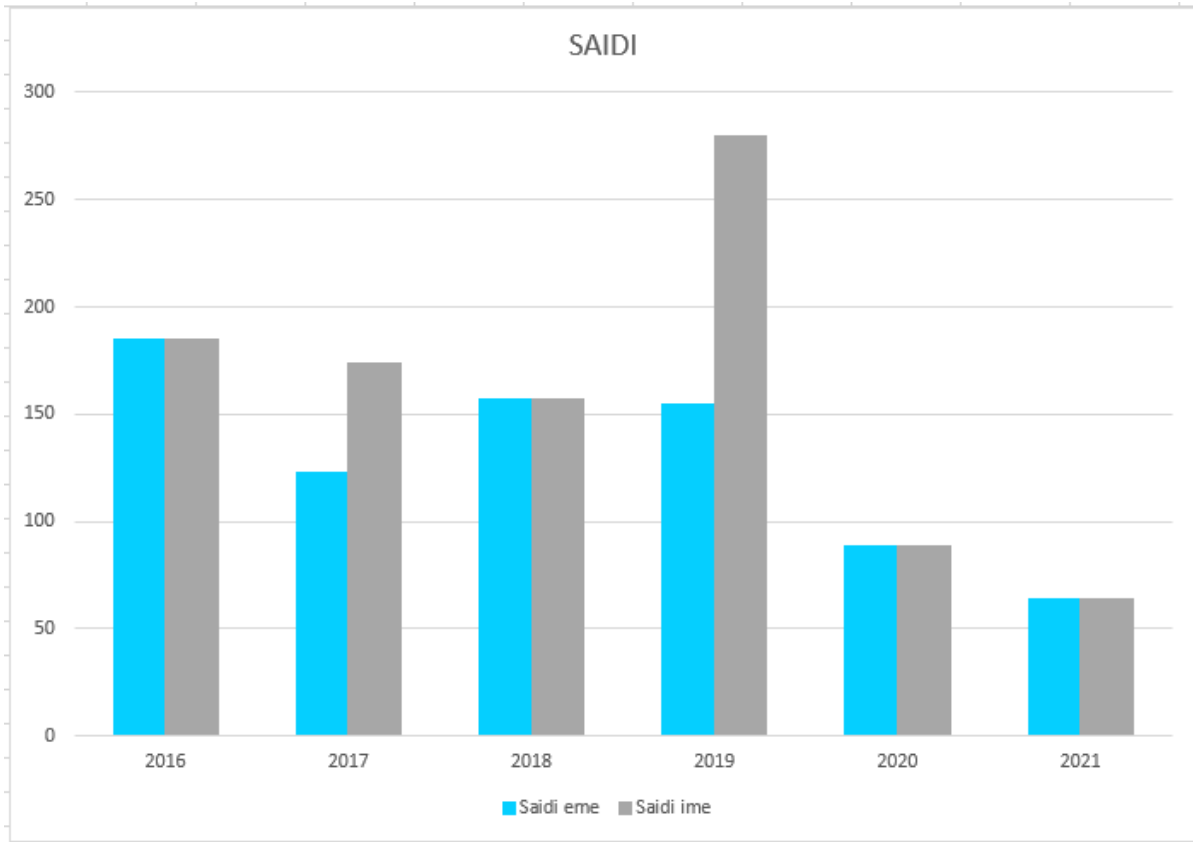
3 A. Yes. Liberty-Empire measures its reliability using two reliability indices: the System  
4 Average Interruption Duration Index (“SAIDI”) and System Average Interruption  
5 Frequency Index (“SAIFI”). SAIDI measures the average time (in minutes) per year  
6 Liberty-Empire customers are without service out of the 525,600 minutes out of every  
7 year. SAIFI measures the average number of interruptions experienced by its  
8 customers on a per-customer basis. For example, a SAIFI value of 1.00 means that  
9 each customer experienced one outage per year.

10 **Q. Have the projects and improvements discussed above specifically impacted**  
11 **Liberty-Empire’s SAIDI and SAIFI numbers in its Oklahoma service area?**

12 A. Yes. These projects have impacted Liberty-Empire’s SAIDI and SAIFI numbers in  
13 two distinct ways. First, during the construction of the new upgrades, the power  
14 delivery system was put into a less reliable condition. Naturally, during the period of  
15 time when these upgrades were being conducted, the SAIDI and SAIFI indices were  
16 much worse. Second, now that many of these projects have been completed, Liberty-  
17 Empire has been able to see marked improvements in both SAIDI and SAIFI. In 2016,  
18 the SAIDI indices for Oklahoma (excluding major events) was recorded at 185.28. The  
19 value for 2021 is 63.59, a reduction of roughly two-thirds. SAIFI also declined  
20 dramatically over the same period, from 2.169 in 2016 to .0967 in 2021, a reduction of  
21 roughly 55%. Figures JW-1 and JW-2 show year-by-year values.

1

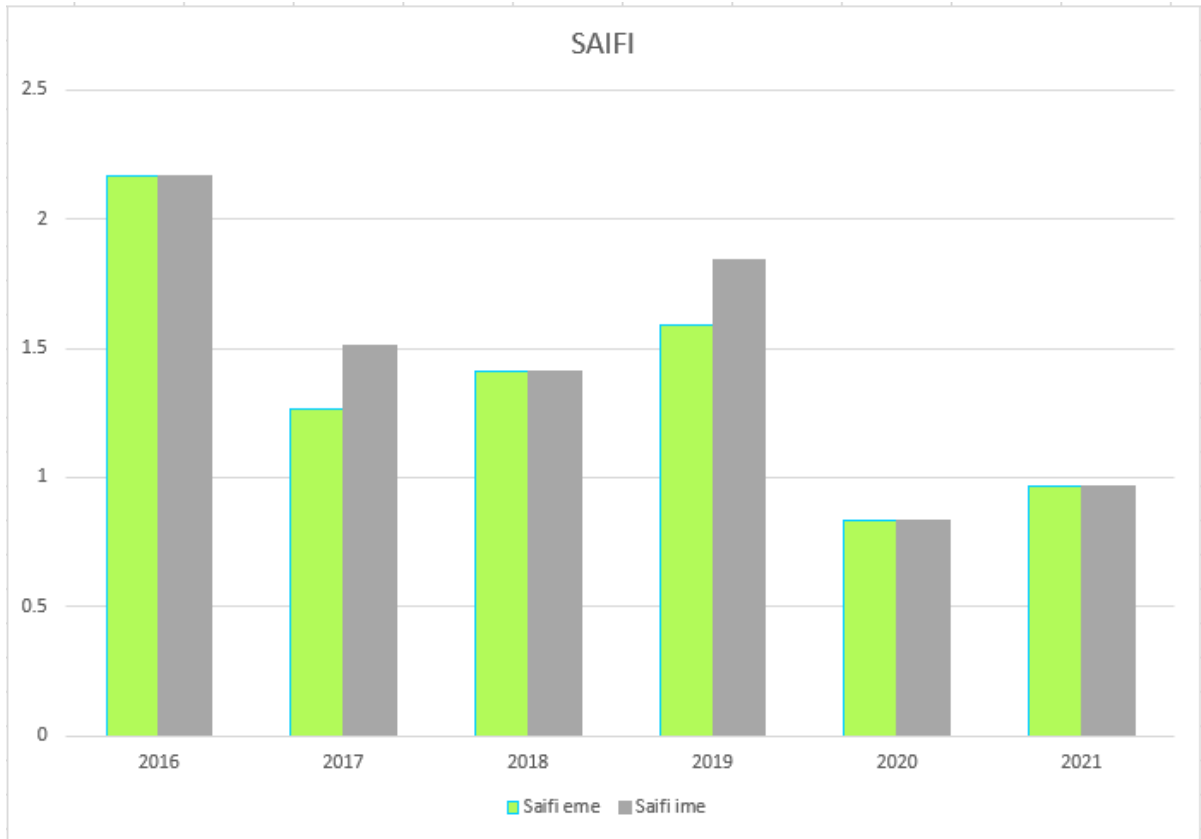
Figure JW-1



2

1

**Figure JW-2**



2

3 **IV. CONCLUSION**

4 **Q. Does this conclude your Direct Testimony?**

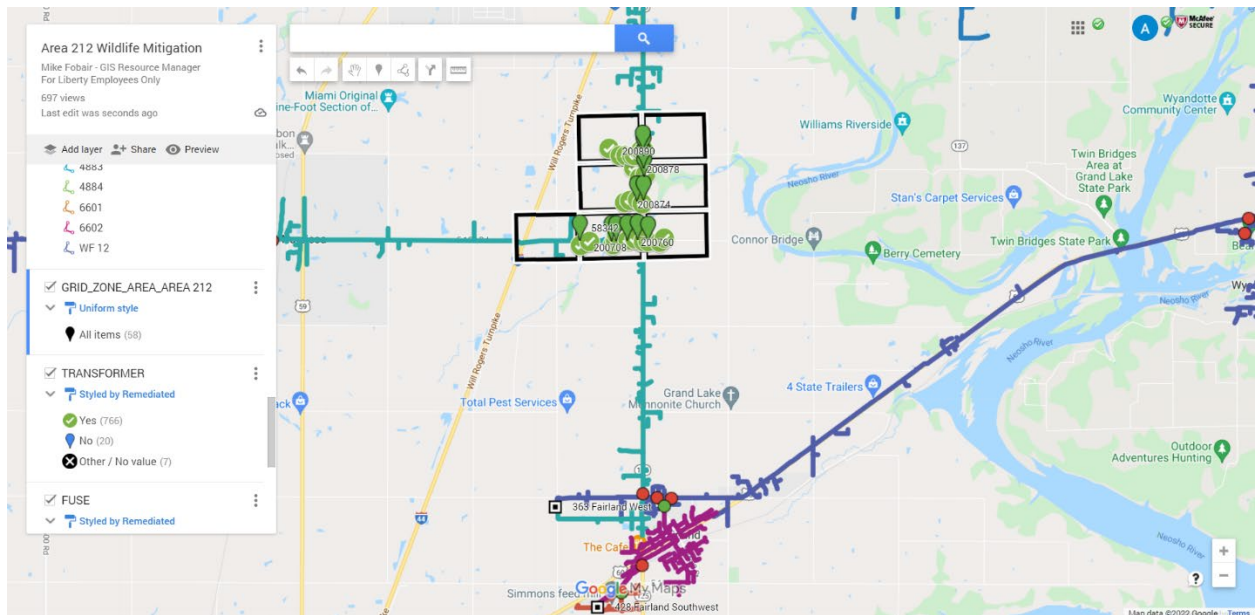
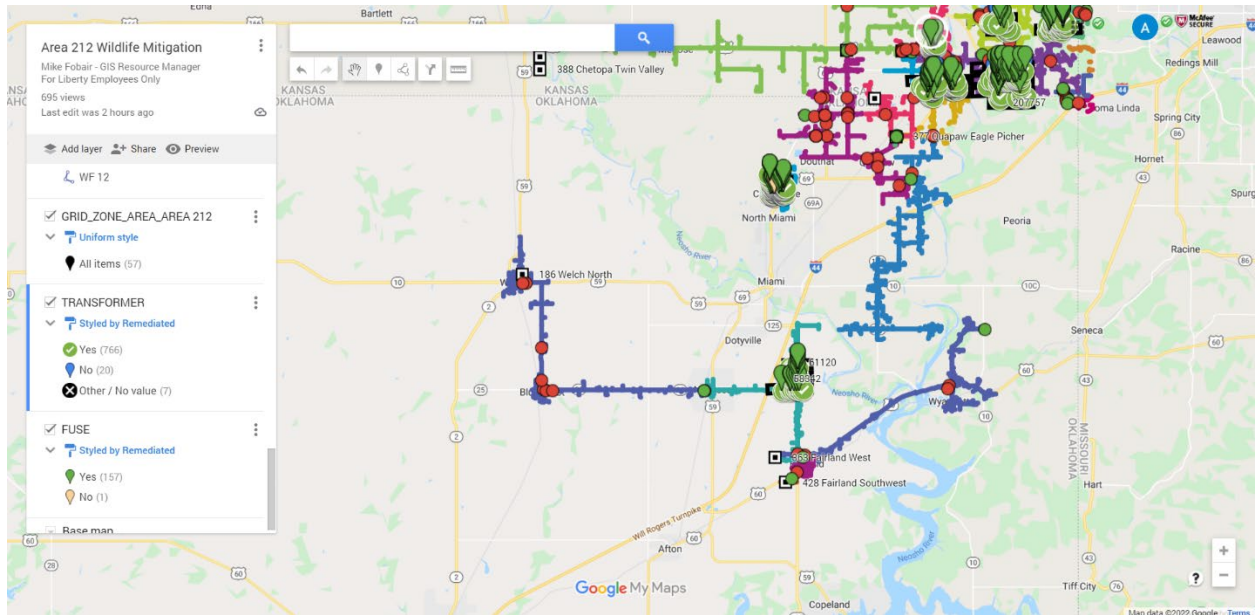
5 **A. Yes.**

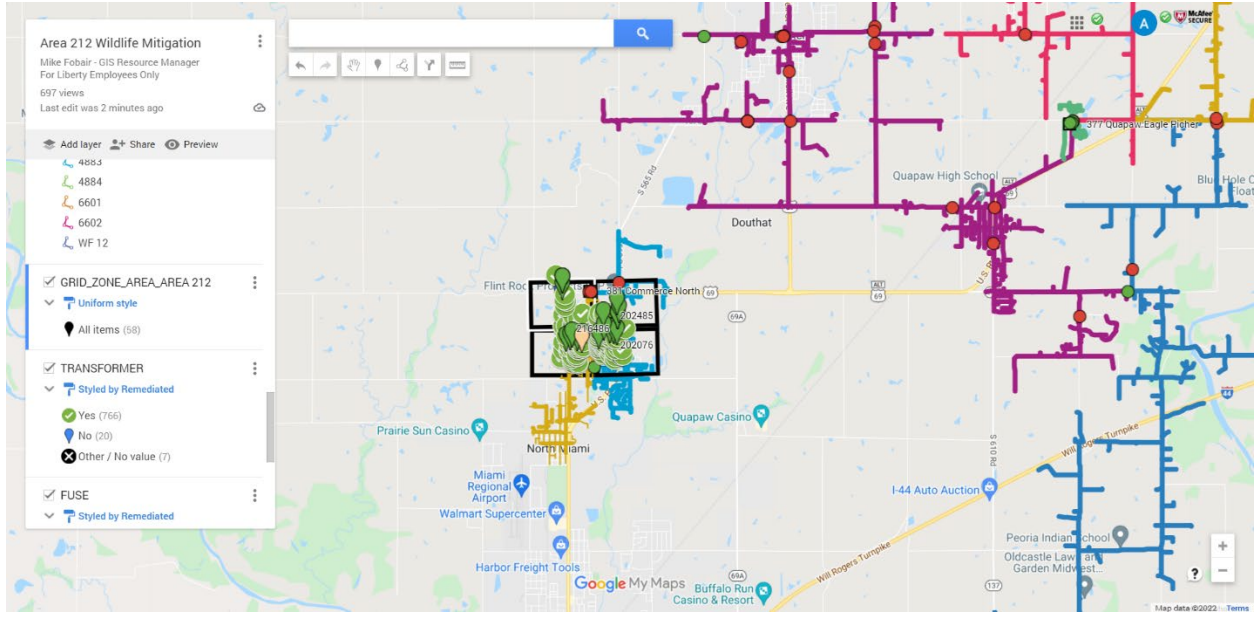


Transmission and Distribution Plant Additions Since Prior Case				
Ferc Function	Funding project	Funding Project Description	Sum of Activity Cost	Explanation
Distribution Plant - Electric	DB0001	Extensions	2,025,846.42	Budget line item reserved for various small scale projects in which extensions to customers and additional new customer connections as needed. Work scopes dependent in extension policy, customer needs, and design requirements to meet new service request(s). Majority work of Construction Design department is encompassed within this budget line item.
Distribution Plant - Electric	DR0212	REBUILD/INC CAPACITY-BAXTER	3,400,583.69	Rebuild conductor and increase switching capability in the OKKS Area Distribution System.
Transmission Plant - Electric	DA0151	Build New 69/12kV Sub at Willard	3,187,265.80	Build new Willard E substation #479 and install new transmission lines and distribution feeders.
Transmission Plant - Electric	DA0154	161/12kV Sub-Hollister Ind Pk	1,577,231.64	Budget line reserved to build new 161/12kV Hollister South Sub #478. Summer load on the existing transformer at Sub #434 no longer has sufficient capacity to provide switching flexibility in contingency situations. Surrounding substations are unable to support the 18-19 MVA of load. An additional 22.4 MVA transformer is needed Addition of 69/12kV 22.4 MVA power transformer, protection relay panels, and oil containment with the removal of the existing 69kV capacitor bank, CTs, reactor stand, capacitor switcher, related foundations, and protection panels. The work at Substation Sub #330 consist of the addition of new capacitor switcher, new capacitor bank relay, and capacitor bank relocated from Sub #434, disconnect switches, bus work, ground grid, conduits, and foundations. Ozark S.E. Substation 434 has one 22.4 MVA transformer. Replace the aged wood equipment and prepare for future 69kv voltage conversion. Complete overhaul of the substation will become necessary including (2) 4kv breakers, (2) 34.5kv breakers that can be changed to 69kv and a 34.5/69/4 kv transformer.
Transmission Plant - Electric	DA0155	Add Xfmr at Ozark Sub #434	1,022,300.00	Replace the aged wood equipment and prepare for future 69kv voltage conversion. Complete overhaul of the substation will become necessary including (2) 4kv breakers, (2) 34.5kv breakers that can be changed to 69kv and a 34.5/69/4 kv transformer.
Transmission Plant - Electric	DR0009	Misc Rebuilds/Add to Dist Subs	1,167,183.28	Budget line reserved to replace the 12kv transfer bus, switches and (3) 12kv breakers at Power site #312.
Transmission Plant - Electric	DR0196	Repl Bus, Switch, Breaker #312	1,244,000.00	Budget line reserved for various storms throughout the system that cause outages and damage to transmission facilities.
Transmission Plant - Electric	STORM JOBS	Storm Jobs	2,145,443.33	Budget line reserved to install Integrated Communication Optical Network (ICON) in the greater Liberty Utility System.
Transmission Plant - Electric	TA0236	Install ICON 20 Node	2,202,904.59	Budget line reserved to install Digital Fault Recorders at Sub #453 and Sub #439 per PRC-002.
Transmission Plant - Electric	TA0238	Install DFR at Select Sites PRC-002	1,744,057.12	Budget line reserved to install Digital Fault Recorders at Sub #392 per PRC-002.
Transmission Plant - Electric	TA0241	Install DFR per PRC-002 #392	1,179,771.00	A new substation is to be constructed approximately three miles north of Humansville, MO. This is in response to a proposed customer growth request for 13MW load. It will be necessary to procure a two to three acre site for this substation. The substation should be consisted of a one-bay 69kV transmission box structure and only a single 69kV breaker to be included for transformer protection of a new 22.4MVA 69/12.47kV power transformer. A D-2 distribution structure shall be constructed and contain three 12.47kV breakers, one of which will feed a 12.47kV circuit. A new control enclosure will be required for this project to house the associated relays, controls, and 125VDC battery array as well as allow space for future panel expansion. The construction of this new substation must be coupled with the conversion of approximately 14.5 miles of 34.5kV transmission line for Fairplay East Sub #217 to Collins South #318 through Humansville West Sub #308. All three substations will require changes/upgrades to accommodate this line conversion. The 34.5kV transmission line from Stockton Northwest Sub #324 to Caplinger Sub #304 will be energized at 12.47kV. Approximately 0.75 miles of distribution line build will be required from Stockton AEC Tie Sub #418 to the existing transmission line connecting substations #324 and #304. This will effectively retire Stockton Northwest Sub #324. Caplinger Sub #304 will then require a new single-phase transformer..
Transmission Plant - Electric	TA0255	BD Health Substn & 69kV insulations	6,678,979.13	Install 3 new 69kv breakers and replace 2 12kv breakers at sub #322 and replace (2) 69kV Dead-End structures and reroute circuit 322-1. Install (3) 161kV breakers and replace (2) 12kV breakers at Purcell Sub #421 due to aging assets and ongoing maintenance issues.
Transmission Plant - Electric	TA0925	Install 69kV Breakers at 322	1,160,352.59	Install (4) 161kV Ring Bus at Pillsbury #447 and New Sub to NW
Transmission Plant - Electric	TA0928	Install 161kV Breakers at 421	1,824,035.38	Install 2-161kV Bkrs at 387
Transmission Plant - Electric	TA0930	Install 2-69kV Breakers at #447	1,986,367.69	Install 3-161kV Bkrs at 395
Transmission Plant - Electric	TA0932	Install (2) 161kV Breakers at #387	2,974,735.89	Install 69kV 3-way Switch at Monett Sub 152 onto steel Pole. Retire 2 69kV wood poles and Install (2) 69kV wood poles.
Transmission Plant - Electric	TA0934	Install (2) 161kV Breakers at #395	2,190,954.25	Operation Toughen-Up project that will improve system reliability for our largest wholesale customer. This project will isolate and restore 69kV transmission service for the City of Monett. Install (3) 1-way 69kV transmission switches, Install (2) 3-way 69kV transmission switches, I/R 69kV transmission structures in an effort to better sectionalize Sub #376 to #311.
Transmission Plant - Electric	TA0935	Instl 2-Way 69kV MOAB TransSch #152	1,203,982.55	Replace one (1) transformer protection panel, one (1) 161-kV circuit switcher with a 161-kV circuit breaker on the high-side of the 22.4 MVA transformer, and two (2) 12-kV feeder circuit breakers in order to install SCADA at Decatur S Sub #392.
Transmission Plant - Electric	TA0941	Install Monett Switch Automation	4,290,025.60	Routine annual reliability inspection to replace or restore structurally inadequate poles identified.
Transmission Plant - Electric	TA0952	Install SCADA at Sub #392	1,247,000.00	Trended budget item. This budget item is used to replace failed transmission equipment in the substation that occur during the year.
Transmission Plant - Electric	TR0001	Replace BO Trans Poles	7,943,476.12	Trended budget item. Rebuild transmission structures and poles identified throughout the year due to failures, discovered potential failures, or other required line moves.
Transmission Plant - Electric	TR0009	Misc Rebuilds/Add - Trans Subs	9,893,261.32	Replace two existing 161/69/12kV autotransformers with a single 100MVA autotransformer relocated from Substation #452. The existing 69kV box structure will be replaced with a 69kV 5-bay ring bus structure, which will include new switches, PTs, and breakers. Temporary reconfiguration of 161kV 91-0 line and the 12kV distribution lines near the substation will be required to support a 161/12kV mobile substation. 161kV 92-0 line will also need to be temporarily reconfigured to support the 161/69kV mobile substation feeding into the bus which feeds the KAMO lines.
Transmission Plant - Electric	TR0010	Misc Rebuilds/Add-Trans Line	3,381,660.98	Relay panels with MDAR and REL relaying, mostly installed around 20 years ago have begun to show a notably higher-than-normal rate of failure. A relay replacement program for these devices was requested by Substation Maintenance and Operations. This plan will eventually replace each existing relay panel with an LU standard SEL-421/311L panel.
Transmission Plant - Electric	TR0014	Inst 161kV & 69kV Bus Diff#184	1,340,000.00	Upgrades required per SPP mandate for Joplin area 69kV system support which included installing an auto transformer and Digital Fault Recorder at Sub #452, install auto transformer at Sub #109 and transmission line exits, reconfigure and install new line exits at Sub #59, and install relay panel package at Sub #430.
Transmission Plant - Electric	TR0113	MDAR Relay Repl Program	2,719,632.27	This transmission line was built in 1928 and now equipment is nearing 100 years old and is difficult to repair. The present conductor is sagged beyond it's useful life and has experienced clearance issues that have been addressed individual over the years.
Transmission Plant - Electric	TR0119	Upgrades Sub South Joplin	2,496,287.92	Install OPGW on Existing 161kV line from Noel #435 to Decatur South #392 to Flint Creek to improve communications for area and system reliability.
Transmission Plant - Electric	TR0134	Rebld/Recond 69kV Riverton to Joplin	19,991,190.64	This project is a portion of Operation Toughen-Up. This project will replace all aged wood structures to adhere to 2018 NESC Grade B construction. There is currently no communications to the areas south of the Neosho area which inhibits the ability to properly clear transmission line faults, obtain loading data, and System Operations' SCADA during system events. This capital expenditure will mitigate these issues.
Transmission Plant - Electric	TR0152	String OPGW 161kV Noel to Decatur	23,271,683.69	A new substation was built across the existing Sub #271 site. The new sub included a four position 69kV ring bus with updated protection packages in a new relay enclosure. Aged equipment was retired, and original Sub #271 site was retained for storage of material to expedite restoration efforts to the radial system(s). At Chetopa Sub #299, rebuilding of high-side structures were needed due to existing clearance concerns, replacement of existing transformer (age and high-side voltage driven), bus work rebuilds (spacing), and replacement of distribution breakers (low-side voltage and interrupt rating). In addition, the 12kV low-side voltage was used to standardize the station transformer specification (spares strategy) and for service to the Twin Valley #388 offtake. This option was selected in lieu of a full substation rebuild (spares strategy). The final step was the conversion of Welch #186. The scope was minor due to preemptive actions taken by Empire to prepare by way of dual high-side voltage windings. High-side fusing and transformer taps were changed, and sub re-energized with new transmission voltage.
Transmission Plant - Electric	TR0154	OPGW on 161kV Neosho to Noel	17,454,377.88	This is a multiphase project to rebuild 69kV transmission line at 33-0 from Sub #614 to Sub #400, Boston Sub #249 to Golden City Sub #251, Golden City Sub #251 to Boston Sub #400 and install automated switch at Boston Sub #400. The 33-0 line has to be upgraded to meet NESC Grade B construction and mitigate integrity of line and structures due to average age of line being around 70+ years.
Transmission Plant - Electric	TR0901	Rebuild 69kV #186 to #388	7,135,511.41	
Transmission Plant - Electric	TR0910	Rebuild 69kV Boston to Greenfield	14,661,265.28	

Devices covered using the distribution wildlife protective device program in the years 2020 and 2021

Maps:





**CERTIFICATION**

The undersigned, Jeffery Westfall, deposes and states that he is Director of Electric Operations – T&D, that he has personal knowledge of the matters set forth in the foregoing responses and the information contained therein is true and accurate to the best of his information, knowledge and belief after reasonable inquiry.

*/s/ Jeffery Westfall* \_\_\_\_\_

Jeffery Westfall