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Witness: Jeffery Westfall
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Case No.: ER-2019-0374
Date Testimony Prepared: August 2019

Before the Public Service Commission of the State of Missouri

Direct Testimony

of

Jeffery Westfall

On behalf of

The Empire District Electric Company
A Liberty Utilities Company

August 2019

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OF
JEFFERY WESTFALL
THE EMPIRE DISTRICT ELECTRIC COMPANY
BEFORE THE
MISSOURI PUBLIC SERVICE COMMISSION
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I. INTRODUCTION

Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A. My name is Jeffery Westfall, and my business address is 602 S. Joplin Avenue, Joplin, Missouri, 64801.

Q. BY WHOM ARE YOU EMPLOYED AND IN WHAT CAPACITY?

A. I am employed by Liberty Utilities Service Corp. as the Central Region Director of Electric Operations – T&D (Transmission & Distribution). My primary responsibilities include line and substation transmission and distribution operations, transmission planning, reliability, vegetation, construction design, dispatch, meters and transformers. I am also responsible for engineering and accountable for proper budgeting and accounting of capital, operating and maintenance expenses for Liberty Utilities' Central Region electric transmission and distribution assets.

Q. ON WHOSE BEHALF ARE YOU TESTIFYING IN THIS PROCEEDING?

A. I am testifying on behalf of The Empire District Electric Company, a Liberty Utilities Company ("Liberty-Empire" or "Company").

Q. PLEASE DESCRIBE YOUR PROFESSIONAL BACKGROUND.

A. I began my employment with Liberty-Empire in December of 1989 in the Building Services department as a night janitor, switchboard operator and mail clerk. In August 1990, I became a warehouseman in the Company's Stores department. In March of 1991, I transferred to the Asbury plant where I held the position of Labor and Labor

semi-skilled. I accepted the position of ground man at the service center in Aurora, Missouri in March 1992. I progressed in classification and obtained my Journeyman Lineman status in June of 1995, which I held until I was named Manager of Line Operations in July of 2008. As the Manager of Line Operations, I oversaw the line operations and maintenance for the Aurora service area, which included managing the workload and outage response for 4 line crews and 3 service trucks. In addition, I was responsible for the capital and operation and maintenance budgets for the Aurora service area. In June of 2015, I accepted the position of Director of Operations – East where my responsibilities were expanded to include our 4 operating areas on the east side of Liberty-Empire's electric service area. In October of 2016, I was promoted to Director of Operations and my responsibility was expanded to include all 8 of the operating service areas. Finally, in October of 2017, I was named the Central Region Director of Operations – T&D.

Q. HAVE YOU PREVIOUSLY TESTIFIED BEFORE THE MISSOURI PUBLIC SERVICE COMMISSION OR ANY OTHER REGULATORY AGENCY?

A. While I have never testified before the Missouri Public Service Commission ("Commission"), I have provided testimony on behalf of the Company before the Oklahoma Corporation Commission.

Q. WHAT IS THE PURPOSE OF YOUR DIRECT TESTIMONY IN THIS PROCEEDING?

A. The purpose of my testimony is two-fold. First, I will discuss the Company's capital investments related to the transmission and distribution systems since the last rate case in Missouri. Second, I will discuss the Company's system reliability metrics and efforts

made by Liberty-Empire to improve service reliability and service quality for customers in Missouri.

II. TRANSMISSION AND DISTRIBUTION CAPITAL INVESTMENTS

Q. WHAT CAPITAL INVESTMENTS IN THE TRANSMISSION AND DISTRIBUTION SYSTEM HAVE BEEN MADE SINCE LIBERTY-EMPIRE'S LAST GENERAL RATE CASE, CASE NO. ER-2016-0023?

A. The Company continually seeks to reinvest in its infrastructure to ensure that its transmission and distribution systems are providing reliable and adequate service to customers. While it is certainly difficult to address all capital investments on the transmission and distribution systems in testimony, I have prepared a list of capital investments in excess of $1 million made in Liberty-Empire's transmission and distribution systems since April 1, 2016 through the end of the true-up period in this case, January 31, 2020. This list includes a description and justification for each capital project and is attached to my testimony as Schedule JW-1. This list includes many of the "Operation Toughen-Up" projects, as well as other capital investments.

Q. WHAT IS "OPERATION TOUGHEN-UP"?

A. In 2010, Liberty-Empire developed a multi-year plan to construct system improvements to improve the reliability of the total system. This reliability plan is often referred to as Operation Toughen-Up. Liberty-Empire is in the midst of implementation of this plan, which is slated for completion in 2021. The total Company budget for Operation Toughen-Up is about $100 million. Approximately $71 million has been invested through the plan so far.

Q. WHY DOES LIBERTY-EMPIRE INVEST IN PROJECTS ON TRANSMISSION AND DISTRIBUTION SYSTEMS?

A. There are many reasons. Obviously, most of the reasons have to do with improving the reliability of the grid. Specifically, certain projects are designed to improve sectionalizing (preventing outages in larger areas when a portion of the system goes down), to meet North American Electric Reliability Corporation regulatory requirements, to harden the system and make it stronger and more resilient to weather, to upgrade voltages and allow certain line segments to handle greater amounts of electricity, to address directives of the Southwest Power Pool ("SPP"), to repair weather-related damage to substation and power lines, to upgrade/update older deteriorating infrastructure, and to replace or add circuit breakers in substations for reliability and sectionalizing purposes.

Q. HOW DOES THE COMPANY DETERMINE WHICH INVESTMENTS TO UNDERTAKE AND HOW TO PROCURE THE NEEDS FOR THOSE PROJECTS?

A. The Company engages in a periodic prioritization process as to what capital budgeted projects should be undertaken. This process includes identifying and ranking projects based on safety, efficiency, reliability, capacity or operations benefits. Once this list is determined, a scoring matrix is used which also considers costs, when selecting the projects to include in the capital budget for each year. Once these steps are complete, Liberty-Empire utilizes its "Procurement Policies and Procedures" to maximize value on the costs the Company spends on materials and services.

Q. PLEASE BRIEFLY DESCRIBE LIBERTY-EMPIRE'S PROCUREMENT POLICIES AND PROCEDURES.

A. The Procurement Policies and Procedures describe how the Company utilizes competitive bidding for purchase of equipment, materials and supplies as well as for

construction, repair and maintenance services which help produce cost savings for our customers.

Q. WERE ALL THE CAPITAL PROJECTS IDENTIFIED IN SCHEDULE JW-1 EVALUATED IN THE ABOVE-DESCRIBED PRIORITIZATION AND PROCUREMENT PROCESSES?

A. Yes, except for blanket projects which are grouped together when approved.

Q. ARE LIBERTY-EMPIRE'S PROCUREMENT POLICIES AND PROCEDURES IN COMPLIANCE WITH THE "RESPONSIBLE CONTRACTOR POLICY" WHICH WAS TO BE IMPLEMENTED FOLLOWING THE CONCLUSION OF CASE NO. EM-2016-0213?

A. Yes. On August 10, 2016, the Commission approved the *Stipulation and Agreement as to LiUNA* (Laborer's International Union of North America) filed in Case No. EM-2016-0213. That stipulation contained the following provision:

> *Empire commits to implementing a Responsible Contractor Policy for construction and maintenance projects that include fixed-price contracts in excess of $1 million. The policy shall consider the inclusion of the following principles and guidelines including experience with past projects; robustness of safety programs; commitment to quality; a skilled workforce; financial integrity; cost and overall prudency; and local sourcing. When assessing bids from contractors who meet the principles included herein, Empire will consider additional cost-savings on a project as a result of contractor-funded training, apprenticeship, and certification programs. To further this objective, Empire will quantify the costs associated with providing similar training, apprenticeship, and certification services in-house.*

In compliance with this stipulation provision, Liberty-Empire revised its Procurement Policies and Procedures to incorporate the "Responsible Contractor Policy." These revisions were finalized in December of 2017.

III. IMPROVEMENTS IN SYSTEM RELIABILITY

Q. HAS THE COMPANY MADE INVESTMENTS IN ITS SYSTEM RELIABILITY?

A. Yes. Liberty-Empire continually seeks to reinvest in its infrastructure to ensure that it is providing safe and reliable service to customers. Also, as noted above, the Company's Operation Toughen-Up is an initiative focused on total system reliability.

Q. WHAT ARE SOME OF THE MISSOURI PROJECTS THAT ARE INCLUDED IN OPERATION TOUGHEN-UP?

A. Some examples of the Missouri projects included in Operation Toughen-Up are discussed below.

Project **Install (4) 69kV Breakers at Fairplay #217** (Completed 2017), enhanced the sectionalization of the 69kV line, which improved service reliability and reduced interruption risk. The project also eliminated a 3-terminal line with repeated history of misoperation and also reduced the system average interruption duration and system average interruption frequency.

Project **Three-Phase Reconductor of #6 Copper in Forsyth** (Completed in 2018), highlighted a 1.3 mile section of deteriorated and underrated conductor. This line had multiple splices and had burned down. This project allowed an alternate switching path into the business district of Forsyth, MO.

Project **Reconductor three-phase #6 Copper in Sarcoxie** (Completed in 2017), replaced 1.8 miles of deteriorated conductor which increased service reliability by allowing for contingent switching. This also complements future possible reconductors in the area.

Project **Install 2-Way 69kV MOAB Transfer Scheme & Replace (4) 12kV Breakers at Joplin NW #341** (Ongoing), will reduce the system average interruption duration and system average interruption frequency. It will reduce the substation's exposure to sustained outage, minimize momentary outages and allow for future intermediate switching points within the transmission line segments. This will add two motor operator switches, voltage sensors, SCADA and breakers.

Q. PLEASE DESCRIBE CIRCUIT SECTIONALIZATION AND WHY IT IS BENEFICIAL FOR SYSTEM RELIABILITY.

A. Liberty-Empire has installed over eleven thousand (11,000) sectionalizing devices in the state of Missouri. The majority of these additional sectionalizing devices were installed on small laterals off of the main distribution line. These devices significantly reduce the number of customers impacted by a fault event by reducing the amount of line protected by any one device and isolating the outage to as few customers as possible. For example, prior to the installation of these additional devices, there may have been hundreds of customers behind a protective device. Now, the additional installed devices essentially isolate any outage to a handful of customers and "sectionalize" the system so that as few customers as possible are impacted by an event.

Q. WHEN YOU INCREASE SECTIONALIZATION, IS THE COMPANY IN A BETTER POSITION TO MAKE ADDITIONAL RELIABILITY IMPROVEMENTS?

A. Yes. With the increased sectionalization, it is much easier to pinpoint problem areas because the geographic area protected by each sectionalizing device is smaller and, therefore, the outages are confined to a smaller number of customers and mitigation options are easier to identify and implement.

Q. WHAT PERCENTAGE OF THE COMPANY'S RELIABILITY PROGRAM EXPENDITURES IS INTENDED TO IMPROVE RELIABILITY FOR LIBERTY-EMPIRE'S MISSOURI CUSTOMERS?

A. To date, Liberty-Empire has spent nearly 64% of its reliability program's expenditures for the specific benefit of Missouri customers. At the completion of the ten-year program, Liberty-Empire reasonably expects that approximately 71% of the total expenditures will provide direct benefit to Missouri customers.

Q. IN ADDITION TO THE 10 YEAR "OPERATION TOUGHEN-UP" RELIABILITY PROGRAM, WHAT OTHER PROGRAMS HELP IMPROVE SYSTEM RELIABILITY?

A. The Commission implemented reliability inspection standards in 2008 that dictate the frequency and thoroughness of system inspections and repairs. Since the implementation of that rule, Liberty-Empire has elected to implement the Missouri standards for inspections and repairs for facilities in all jurisdictions served by Liberty-Empire. Liberty-Empire performs routine scheduled inspections and vegetation clearing to maintain the reliability of transmission and distribution circuits. Since the inception of these standards, over 148,000 poles were subjected to a pole ground-line (intrusive) inspection (excavate and drill the pole to determine the condition of the pole), over 466,000 poles and devices were subjected to a detail inspection (visual inspection which includes infrared inspection of pole-mount and pad-mount equipment) and over 614,000 poles and devices were subjected to a patrol inspection (visual inspection). In the past 5 years because of these inspections, over 6,400 poles and devices have been replaced. In addition to the inspections, Liberty-Empire also

monitors reliability information on a monthly basis to determine if there are trends in reliability statistics which indicate a need for further investigation.

Q. HAS LIBERTY-EMPIRE UNDERTAKEN ANY OTHER RECENT PROJECTS TO IMPROVE RELIABILITY FOR MISSOURI CUSTOMERS?

A. Yes. In 2016, distribution circuit 4172 serving a portion of Carl Junction, MO was identified as needing a rebuild along Joplin Street. The line segment serves the northwest portion of Briarbrook subdivision and several surrounding residences. The line segment was rebuilt with additional protective equipment and sectionalizing points. The construction provided direct benefit to the customers served by the line segment. All other customers served by the circuit received additional benefit from the protective equipment and sectionalizing points. The significant value of this construction was realized on May 22, 2019 after an EF-3 tornado touched down adjacent to the rebuilt line. The line received minimal damage and improved restoration time for customers. The added sectionalizing points better allowed the circuit to be configured to isolate damaged portions and maintain service to customers.

In 2016, distribution circuit 1091, serving a portion of Duquesne, MO was identified as needing a reconductor along Prigmore Road. The line segment serves as a transfer path between circuit 1091 and 4712 allowing load to be moved between two substations. The line segment conductor was originally installed to serve radial load, but was converted to a transfer path after the addition of the Kodiak substation. The small conductor was unable to meet the load requirements to allow transfers. Since completion of the project, the load has been transferred multiple times to allow for substation maintenance, substation upgrades, and to improve outage restoration time.

Since 2014, 14 multi-year worst performing circuits have been identified and addressed. When appropriate, a sectionalization project has been implemented for these poor performing circuits. In addition to addressing multi-year worst performing circuits, Liberty-Empire has performed sectionalization on 64 additional circuits.

In 2016, the radial transmission line serving Hermitage, MO had new conductor supports installed on existing wood poles to improve reliability. The existing poles were previously inspected and did not require replacement, but the existing crossarms were deteriorated and causing interruptions. The crossarms were removed and the pole framing changed to horizontal offset insulators to improve reliability.

Also, in 2017, the transmission line serving Brighton, MO had new conductor supports installed on existing wood poles to improve reliability. This line segment shared the same style and age of crossarm as the line serving Hermitage.

In 2016, an automatic transfer switching scheme was installed at the Brighton substation serving Brighton, MO. The switching scheme allows for automatic restoration when a fault occurs on only one of the two transmission lines serving the substation. This same style of solution has been installed on several other substations.

In 2016 and 2018, transmission line breakers were installed on the substations serving Carl Junction, MO and surrounding areas. On May 22, 2019 the breakers allowed for a continuity of service to many customers despite a transmission line fault due to the EF-3 tornado that damaged the area. This improvement also increased public safety as many customers maintained the ability to receive critical weather information during the event.

Q. HAVE THESE EFFORTS LED TO IMPROVEMENT IN SERVICE RELIABILITY?

A. Yes. Liberty-Empire measures its reliability using two reliability indices: the System Average Interruption Duration Index ('SAIDI") and the System Average Interruption Frequency Index ("SAIFI"). SAIDI measures the average time (in minutes) per year Liberty-Empire customers are without service out of the 525,600 minutes out of every year. SAIFI measures the average number of interruptions a customer experiences. For example, a SAIFI value of 1.00 means that each customer experienced one outage per year.

Q. WHAT HAS LIBERTY-EMPIRE SEEN WITH REGARD TO ITS SAIDI AND SAIFI RESULTS IN THE PAST FEW YEARS?

A. In 2018, Liberty-Empire's SAIDI value for its Missouri circuits was 102.55 minutes. This is a significant reduction from the 2010 SAIDI value of 141.73 minutes. Similarly, in 2018, Liberty-Empire's SAIFI value for its Missouri circuits was 1.120. This is also a significant reduction from the 2010 SAIFI value of 1.400.

Q. HAVE THE PROJECTS AND IMPROVEMENTS DISCUSSED ABOVE IMPACTED LIBERTY-EMPIRE'S SAIDI AND SAIFI NUMBERS IN MISSOURI?

A. Yes. These projects have impacted Liberty-Empire's SAIDI and SAIFI numbers in two distinct ways. First, the power delivery system was put into a less reliable condition during the construction of the new upgrades. Naturally, during the period of time when these upgrades were being conducted, the SAIDI and SAIFI indices were much worse. Second, now that many of these projects have been completed, Liberty-Empire has been able to see marked improvements in both SAIDI and SAIFI.

Q. DO THE COMMISSION RULES SPECIFY WHAT THE GOALS ARE FOR SAIDI AND SAIFI PERFORMANCE?

A. The rules do not specify explicit performance goals. Instead, they provide specific reliability enhancing activities which are to be routinely performed, including vegetation clearing, infrastructure inspections, and monitoring and remediation of poor performing circuits. The Company's performance indicates that its investments to meet these requirements have been prudent.

Q. DOES THE COMPANY'S LABOR FORCE HAVE AN IMPACT ON THE COMPANY'S ABILITY TO PROVIDE RELIABLE SERVICE?

A. Yes. It is very important that Liberty-Empire have an adequate number of trained employees in order for the Company to provide reliable service.

Q. IS THERE A PARTICULAR LABOR CATEGORY WHICH IS CAUSING THE COMPANY CONCERN?

A. Yes. Utilities have struggled to hire and retain the desired number of journeyman lineman, and this problem has grown considerably worse recently.

Q. PLEASE EXPLAIN.

A. Today there is a very high demand for employees that have the unique skillset of journeyman lineman. Utilities, cooperatives, and contractors across the nation are competing for a highly skilled workforce to support their efforts of increased reliability, infrastructure upgrades, and increased responsiveness to customer requests. This has caused this high demand for this skillset. This has been more prevalent within the utility contractor industry. With this high demand, utility contract companies are now willing to offer high premium pay and other benefits including daily per diems in an effort to meet their workforce needs. In most cases, employees have been able to double and even triple their compensation. The demand has primarily been on the west coast. This

increased competition for skilled journeymen has taken a toll on several utilities and cooperatives across the country, and Liberty-Empire is no exception.

Q. HOW DOES THE COMPANY PROPOSE TO REMEDY THE SITUATION?

A. Utilities and cooperatives today are trying many different ways to combat this including sign on bonuses to help attract this skillset, retention bonuses to help retain existing employees, increased wages and more lucrative work practices (increased callout minimums and more overtime availability etc.). Our plan is to offer monthly retention bonuses of $1.5k until the increased competitive job market for journeyman subsides. We would also promote this incentive external to attract lineman. We have several other employees that also hold this skillset in other key roles within Liberty-Empire. In an effort to retain those employees, we plan on offering them this retention bonus as well. We feel this situation will not continue long term. However, we cannot predict when it will end.

Q. WILL THE COST OF PROVIDING SERVICE TO LIBERTY-EMPIRE'S CUSTOMERS INCREASE AS A RESULT OF THIS PROGRAM?

A. Yes. Company witness Sheri Richard addresses this increase in costs in her testimony. Although the program will result in an increase in the Company's cost of service, the program is in the interest of customers. Implementation of the program will increase the Company's ability to hire and retain necessary skilled workers and will assist the Company in providing safe and reliable service.

Q. DOES THIS CONCLUDE YOUR DIRECT TESTIMONY?

A. Yes.

Sum of Total Witness	Budget	Project Type	Budget Description	Total	Category	Explanation
Jeff Westfall	DA0156	Standard	Cap Inc & Brkrs-Ozark NW #330	6,452,982	Improvement	Project will allow for redundant capacity at the newly built substation. Replacement of aged equipment will result in a more robust service for the customers as well as develop a platform in which alternate switching capabilities will be realized between subs #330 and #415 as well as #330 and #434.
	DA0156 Total			**6,452,982**		
	DA0158	Standard	New 161/12kV Sub#477 Jop-Wildwood	6,386,711	Growth	Customer driven project. Legacy Empire did not have capacity from existing substation to serve the level of demand. New substation allowed for not only the new customer to be adequately served, but also positioned Legacy Empire to readily serve future developement, both residential & commercial/industrial in the Wildwood Ranch area. Project allowed for Legacy Empire to more quickly respond to prospective load inquiries, future development and an increase to the reliability of the customers served in the Galena & W Joplin areas.
	DA0158 Total			**6,386,711**		
	DA0164	Standard	New 690/12kV 10.5 MVA Portable Sub	1,785,695	Replenishment	Increases system mobile force and aides in construction of 2018 due to large number of outages and helps facilitate mutiple ongoing construction projects.
	DA0164 Total			**1,785,695**		
	DB0001	Blanket	Extensions	22,927,556	Growth	Extensions to customers on system throughout the year as needed.
		Standard	Extensions	11,969,270		
	DB0001 Total			**34,896,826**		
	DB0004	Blanket	Street Lighting	2,266,430	Growth	Repair/Replace street lights across system as needed.
		Standard	Street Lighting	111,326		
	DB0004 Total			**2,377,756**		
	DB0005	Blanket	Distribution Transformers	4,764,347	Replenishment	Planned or unplanned installation/removal or replacement of distribution transformers as needed across system.
		Standard	Distribution Transformers	76,117		
	DB0005 Total			**4,840,464**		
	DB0006	Blanket	Customer's Meters	4,023,956	Growth	Planned or unplanned installation/removal or replacement of distribution meters as needed across system.
		Standard	Customer's Meters	214,950		
	DB0006 Total			**4,238,906**		
	DB0007	Blanket	Customer's Services	10,782,885	Growth	Install/remove or replace services to customers as needed across system.
		Standard	Customer's Services	245		
	DB0007 Total			**10,783,130**		
	DB0008	Blanket	Substation Blankets	1,389,173	Improvement	Planned or unplanned installation/removal or replacement of equipment needed within substations across system as needed.
		Standard	Substation Blankets	382,777		
	DB0008 Total			**1,771,950**		
	DB0010	Blanket	Misc Dist of OH Lines	12,199,775	Replenishment	Install/remove or replace overhead assets across system as needed.
		Standard	Misc Dist of OH Lines	766,529		
	DB0010 Total			**12,966,304**		
	DB0011	Blanket	Misc Dist of UG Lines	1,526,110	Replenishment	Install/remove or replace underground assets across system as needed.
		Standard	Misc Dist of UG Lines	2,711,680		
	DB0011 Total			**4,237,790**		
	DR0001	Standard	Relocate T&D for Hwy Changes	3,039,545	Replenishment	Trended budget item required for city and state road moves. In some years, if there are scoped/known projects, dollars may be budgeted in addition to the trend.
	DR0001 Total			**3,039,545**		
	DR0002	Blanket	Replace Bad Order Distr Poles	1,735,010	Replenishment	System reliability and public safety are improved by the identification and replacement of reject poles prior to structural failure.
		Standard	Replace Bad Order Distr Poles	6,675,390		
	DR0002 Total			**8,410,400**		
	DR0008	Standard	Distr. Reliability Improvement	2,080,566	Improvement	Use for reliability improvements on worst-performing distribution circuits. Work includes fusing of lateral taps, coordination and re-fusing of existing fuse locations, and coordination and placement of single and three-phase reclosers.
	DR0008 Total			**2,080,566**		

Sum of Total Witness	Budget	Project Type	Budget Description	Total	Category	Explanation
	DR0009	Standard	Misc Rebuilds/Add to Dist Subs	6,505,185	Replenishment	Trended Budget Item. Project need for various rebuilds and additions to distribution substation facilities as needed.
	DR0009 Total			**6,505,185**		
	DR0165	Standard	Incr 161/12kV Capacity SUB 110	3,502,861	Improvement	Oronogo Jct. Sub #110 69/12 kV transformer has 9.1 MVA on a 10.5 MVA transformer (summer peak data). However, 1 circuit out of Oronogo Jct. #110 is open and is being fed from Joplin NE #360. This substation is strategically located for increased capacity and could relieve loading on several substations, including Joplin - Fir Rd. #417, Joplin NE #360, Webb City North #436, and Oakland North #432.
	DR0165 Total			**3,502,861**		
	DR0180	Standard	Inc 69/12kV Cap Quapaw Sub 377	4,312,354	Growth	This project is for 12-kV capacity increase or relief of Quapaw #377. This is based on capacity increase at Quapaw #377 from a 10.5-MVA transformer to a #22.4-MVA xfmr protected by a 69-kV circuit switcher. Peak loading at Quapaw #377 is 98% of xfmr capacity in winter peak, and is at 87% of xfmr capacity in summer peak, according to data compiled in March, 2011.
	DR0180 Total			**4,312,354**		
	DR0182	Standard	Replace Bad Swchgr at #367	2,562,592	Improvement	Bolivar switchgear was a safety concern. Cabling was laid out on substation surface, which introduced further safety concerns. This project allowed for safe operational duties and the ability to make use of all existing circuits out of the subsation. Switching flexibility was also increased in the Bolivar area.
	DR0182 Total			**2,562,592**		
	DR0198	Standard	Repl Xfmr #2 with 22.4MVA at Sub416	1,126,746	Growth	City of Monett identified the need for additional capacity out of sub #416. EDLU entering contract for additional capacity to serve this customer and increases load.
	DR0198 Total			**1,126,746**		
	DR0209	Standard	Rebuild/Increase Cap-Branson	1,336,575	Improvement	
	DR0209 Total			**1,336,575**		
	DR0214	Standard	Rebuild/Increase Cap-Joplin	1,022,348	Improvement	
	DR0214 Total			**1,022,348**		
	DR0217	Standard	R&I Capacity Ozark Area DS	1,107,247	Improvement	
	DR0217 Total			**1,107,247**		
	DX	Standard	Excess Facilities	1,848,534	Growth	Customer Driven Projects
	DX Total			**1,848,534**		
	STORM JOBS	Blanket	Storm Jobs	1,504,376	Replenishment	Repairs/Replacements to system due to storm damage.
		Standard	Storm Jobs	878,466		
	STORM JOBS Total			**2,382,843**		
	TA0089	Standard	New 161 In&161/12 Sub S Monett	3,765,144	Improvement	Need arises from SPP Transmission Expansion Plan Contingency Analysis. Additional auto-transformer needed in Monett area as provisioned for the contingency of a Monett #383 auto-transformer outage (2 year minimum lead-time on replacement auto). 69kV system overloads in immediate area of Monett during this contingency and voltage support is marginal during long term outage. This project will also eliminate the need for a 24 mile, 69kV reconductor between Diamond #131 and Monett #383 projected for 2016.
	TA0089 Total			**3,765,144**		
	TA0236	Standard	Install ICON 20 Node	1,187,103	Improvement	This project is a reliability improvement project. It will replace existing carrier and DIT tone with a point-to-point fiber optic connection between communication assisted protection schemes. This will provide a more secure and stable communication channel configured in a ring topology allowing for path rerouting in the event of a fiber break. SCADA reliability will be improved by having the Primary and Back-Up control centers on separate rings along with providing a more secure SCADA network. In addition, the ICON project will reduce the fiber pairs needed at various locations due to protective relaying needs. SCADA and protection will be multiplexed using one fiber optic pair. The ICON network satisfies NERC PRC-005-02 requirement to periodically test teleprotection schemes for channel integrity.
	TA0236 Total			**1,187,103**		
	TA0919	Standard	Install 69kV Breakers at 217	3,422,944	Improvement	Increase customer service reliability, reduced interruption and miscoordination risk.
	TA0919 Total			**3,422,944**		
	TA0920	Standard	Inst 5 69kV Breakers Sub 94	3,853,202	Improvement	Increase customer service reliability, reduced interruption risk.

Sum of Total Witness	Budget	Project Type	Budget Description	Total	Category	Explanation
	TA0920 Total			**3,853,202**		
	TA0921	Standard	Install 2-161kV Breakers at #417	2,176,256	Improvement	Increase customer service reliability, reduced interruption risk.
	TA0921 Total			**2,176,256**		
	TA0927	Standard	Install Distribution SCADA	2,003,914	Improvement	This is an Operation Toughen-Up project. SCADA provides enhanced operational efficiency and the ability to remotely interogate substation real-time status information and control when needed. This information provides operational awareness which improves proactive decision making and can help reduce SAIDI and SAIFI.
	TA0927 Total			**2,003,914**		
	TA0931	Standard	Install (2) 161kV Breakers at #366	5,614,015	Improvement	This is an Operation Toughen-Up project that will sectionalize the 85-0 transmission line and reduce SAIDI and SAIFI. This project is related to and in conjunction with the following budget items: TA-921 - Breaker install at Fir Rd. #417, TA-928 - Breaker install at Purcell #421 and TA-934 - Breaker install at Carthage #395
	TA0931 Total			**5,614,015**		
	TR0001	Standard	Replace BO Trans Poles	3,815,538	Replenishment	Routine annual reliability inspection to replace or restore structurally inadequate poles identified.
	TR0001 Total			**3,815,538**		
	TR0009	Standard	Misc Rebuilds/Add - Trans Subs	5,902,691	Replenishment	Trended budget item. This budget item is used to replace failed transmission equipment in the substation that occur during the year.
	TR0009 Total			**5,902,691**		
	TR0010	Standard	Misc Rebuilds/Add-Trans Line	3,039,874	Replenishment	Trended budget item. Rebuild transmission structures and poles identified throughout the year due to failures, discovered potential failures or other required line moves.
	TR0010 Total			**3,039,874**		
	TR0113	Standard	MDAR Relay Repl Program	1,215,934	Improvement	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 EDE standard SEL-421/311L panel.
	TR0113 Total			**1,215,934**		
	TR0115	Standard	Repl Obsolete Transm Relaying	1,045,183	Growth	The project at Riverside #438 is required to get the full benefit of the upgrades in coordination with TA-932 and DA-154.
	TR0115 Total			**1,045,183**		
	TR0119	Standard	Upgrades Sub South Joplin	15,200,083	Improvement	Multiple upgrades at multiple substations needed in lieu of South Joplin 161kV conversion project. Due to increase generation on the west side of the EDE transmission system along with load remaining on the 69kV system, upgrades to the Joplin 69kV corridors and terminal equipment are needed to incorporate higher flows under contingency scenarios. Presently, terminal equipment being addressed to increase ratings as high as possible before line ratings are exceeded and become limiting elements for specific facility ratings. As load increases and generation profiles change, substantial future line reconductors will be needed on the 69kV system in the immediate Joplin area.
	TR0119 Total			**15,200,083**		
	TR0124	Standard	Rec 69kV-Nichols#170 - Rep#359	9,489,066	Improvement	Project added due to SPP Transmission Expansion Plan. An NTC for this project was received as SPP models showed contingencies with loss of transmission support from the west cause this section of line to overload.
	TR0124 Total			**9,489,066**		
	TR0907	Standard	Inst Fib Asbury#349 to Carthage#395	2,879,929	Improvement	Increase customer service reliability, reduce interruption risk. Eliminate the need to install PLC and then remove it when TA-921 is complete. Project will also establish communication capabilities for future projects.
	TR0907 Total			**2,879,929**		
Jeff Westfall Total				**194,587,183**		
Grand Total				**194,587,183**		

Sum of Best Estimate FERC Function	Budget	Department	Total	Category	Explanation
Distribution Plant - Electric	**000000**	Controller	-		
	CG0000	Default	-		
	DA0001	Line Design Engineering	10,000.00	Growth	These devices are normally installed for distribution voltage correction and for reactive load compensation. New electronic cap bank and regulator controls also allow for monitoring and recording of voltage changes. In some cases current can also be recorded. Cooper controllers are antiquated to a point which communications cannot be established to poll devices. Updating the controls will allow for proper operation of devices and establish a platform for future automation controls.
		Line Operations Joplin	74,673.90		
	DA0006	Line Operations Joplin	103,000.00	Improvement	This effort is way of piloting best utility practices on the Empire distribution system by way of testing new/different devices at strategic locations as compared with a system-wide approach. The pilot program involves installing approximately 20 devices at pre-examined/determined locations so as to gain site specific knowledge on the efficacy of the Trip Saver II devices as well as the associated costs for installation on a per site basis. The genesis of this line item was based on Empire Operations Personnel's participation in restoration efforts alongside FPL, specifically during Hurricane Irma, where these devices had been implemented and already shown operational benefits to the host utility. For prudency, the devices were reviewed for applicability (fault current interruption, voltage operability, installation efforts/costs, supplemental support infrastructure, etc.) and locations for possible implantation were determined as possible candidate locations (again, based on effectiveness, locational proximity to Operation Facilities, and number of outages experienced). The program was initially funded by way of a per site estimated cost. Empire hopes to glean operational knowledge, refine installation cost estimates, and lessons learned on the Trip Saver II devices for possible future implementation.
	DA0151	Line Design Engineering	4,066,073.51	Growth	
		Substation Maintenance - East	3,716,000.00		
	DA0154	Line Design Engineering	497,220.31	Growth	Will alleviate loading on Sub #438, #413, #387 Branson area xfmrs, which will allow for alleviation of the northern corridor of Branson area substations. Peak loading values for 3 directly affected substations are as follows: #413 - 49.4 MVA [14.4+17.7+17.3] (2014) #387 - 22.1 MVA (2014); #438 - 24.0 MVA (2014) Presently, no switching flexibility is available on Hollister Sub #387 or Riverside #438 during peak loading conditions under various single contingency scenarios. Switching flexibility will greatly increase and will poise Empire to readily absorb growth and load development in/around the Branson Creek & Hollister Industiral Park areas. Transmission is readily available in the immediate area and will benefit from improvements slotted for Hollister #387 breaker install project, scheduled in 2017.
		Substation Maintenance - East	6,960,000.00		
	DA0155	Line Design Engineering	-	Growth	Summer 2010 loading was 18.3 MVA, 2011 loading was 19.5 MVA and 2012 loading was 18.5 MVA on a 22.4 MVA transformer. With less than 1-2 MVA available capacity, additional transformer is needed to separate load and allow for switching flexibility in contingency situations. Loss of existing transformer would require extended dedication of mobile to Ozark SE #434. Surrounding substations unable to support 18-19 MVA of load present at Ozark SE #434. Project will incompass 3 - new 12kV breakers on new string, removal of present 434-3 CB, replacement of existing 434-1 CB with new. Conduit will be installed for future UG Getaways on interior bay positions on both strings.
		Substation Maintenance - East	2,809,403.34		
	DA0164	Substation Maintenance - West	125,000.00	Replenishment	Increases system mobile force and aides in construction of 2018 due to large number of outages and helps facilitate mutiple ongoing construction projects.

Sum of Best Estimate FERC Function	Budget	Department	Total	Category	Explanation
					This project was a direct result of a customer expansion project in the Neosho, MO area, however the project also was scoped to allow for future expansion and load growth opportunities within the co-located industrial park. Empire was approached in Q2 of 2018 with the possibility of expanding operations at the present Praxaire location in the industrial park of Neosho, MO. Empire met with the customer multiple times to discuss the specifics of load to be added (machine and motor types) and present demand/usage. The proposed additional load was approx. 4 MW with unknown reactive power demands. The existing transformer loading of 8.5MW on a the station transformer rated at 10.5MVA FOFA evidenced the need for additional capacity to serve the proposed 4MW. Furthermore, it was determined that due to the peak demand requirements for the large motors already present and lack of motor starting capabilities at other substation sites within the Neosho area paired with the additional exposure if an offsite substation location were chosen, that an expansion project would be required to serve the additional load. By expanding capacity at the already present substation for Praxaire (#314 Linde), there were three readily identified benefits to the Neosho area: (1) The customer could expand operations as proposed, (2) utilizing the existing infrastructure dedicated to Praxaire would insulate residential customers from voltage depression incidents due to the high demand placed on infrastructure during the large motor starting events, (3) position the industrial park for future growth, while increasing reliability by establishing a location for a future 69kV loop tie. Multiple project scopes were vetted in an attempt to directly serve the customer expansion and as a result, a new ring bus configuration and additional transformer was determined to meet the needs of not only the customer's expansion project, but also to allow for future looping of the 69kV
	DA0166	Substation Maintenance - West	5,160,000.00	Growth	system.
	DB0001	Construction Design - West	142,494.68	Growth	Extensions to customers on system throughout the year as needed.
		Line Operations Aurora	110,796.81		
		Line Operations Baxter	30,000.00		
		Line Operations Bolivar	91,605.92		
		Line Operations Branson	263,345.26		
		Line Operations Joplin	587,535.71		
		Line Operations Neosho	548,781.10		
		Line Operations Ozark	307,185.48		
		(blank)	624,117.19		
	DB0002	Line Operations Baxter	74,050.92	Growth	Power Extenstion per customer request
	DB0004	Construction Design - West	37,532.03	Growth	Repair/Replace street lights across system as needed.
	DB0005	Line Operations Joplin	46,657.00	Replenishment	Planned or unplanned installation/removal or replacement of distribution transformers as needed across system.
	DB0008	Substation Maintenance - West	31,000.00	Improvement	Planned or unplanned installation/removal or replacement of equipment needed within substations across system as needed.
	DB0010	Construction Design - East	19,547.32	Replenishment	Install/remove or replace overhead assets across system as needed.
		Construction Design - West	7,055.00		
		Line Design Engineering	3,536.90		
		Line Operations Joplin	35,424.73		
		Substation Maintenance - West	10,000.00		
		(blank)	14,287.36		
	DB0011	Construction Design - East	10,138.62	Replenishment	Install/remove or replace underground assets across system as needed.
		Construction Design - West	50,635.88		
		Line Design Engineering	133,219.63		
		Line Operations Bolivar	303,995.68		
		Line Operations Branson	142,195.86		
		Line Operations Joplin	500,714.59		
		Line Operations Neosho	-		
		(blank)	15,728.39		
	DR0001	Line Design Engineering	1,166,883.47	Replenishment	Trended budget item required for city and state road moves. In some years, if there are scoped/known projects, dollars may be budgeted in addition to the trend.
		Line Operations Aurora	36,000.00		
		Line Operations Baxter	154,000.00		
		(blank)	5,330.58		
	DR0002	Line Operations Aurora	727,903.83	Replenishment	System reliability and public safety are improved by the identification and replacement of reject poles prior to structural failure.
		Line Operations Baxter	2,067,453.36		
		Line Operations Bolivar	801,203.92		
		Line Operations Branson	511,067.00		
		Line Operations Joplin	3,425,225.94		
		Line Operations Neosho	3,586,687.02		
		Line Operations Ozark	158,576.73		

Sum of Best Estimate FERC Function	Budget	Department	Total	Category	Explanation
	DR0002	Line Operations Webb City	5,763.70		
		(blank)	71,351.57		
	DR0004	Line Design Engineering	-	Improvement	As a result of contingency analysis, project encompasses the conversion of the 4kV to 12kV. Aged and unique 4kV infrastructure is cause for concern in the event of a failure due to the long lead times and lack of available replacement equipment available. Options are lacking to support the load served on the 4kV system. A conversion over multiple years and multiple phases will accomplish the intended upgrades and will segment the large scope of work into manageable pieces. Exterior 4kV ckts out of sub #64 will be in phase 1 of the conversion. This will also allow for remaining 4kV load to be moved to #64 in the event of equipment failure at #284. This buys time to scope next phases of project. Ckts will be identified for conversion and phased in accordingly. Unknown number of existing clearance issues may result in alternative construction methods to accomplish needed feeder configuration(s). (2) Future 69/12kV substations will be needed to support the downtown area as replacement of former 4kV substations.
	DR0006	Line Operations Joplin	123,000.00	Improvement	Loading on this circuit was difficult to balanace because of the 3-long single-phase taps located downstream from the section where 3-phase construction transitions to open-wye. Protection coordination was also hindered on this circuit due to consecutive single-phaes reclosers.
	DR0007	Line Operations Joplin	250,000.00	Improvement	North American Electric Reliability Corporation (NERC) Critical Infrastructure Protection Standard CIP-003 R2, requires Physical Security Controls for low impact substations: "Each Responsible Entity shall control physical access based on need as determined by the Responsible Entity to: (1) the asset or the locations of the low impact BES Cyber Systems within the asset, and (2) the Low Impact BES Cyber System Electronic Access Points (LEAPs), if any". The rekeying of the substation will allow Empire to issue a substation specific key to the individuals that "need" access to the substation and to meet the compliance requirement.
		(blank)	10,005,020.00		
	DR0008	Line Operations Aurora	224,866.00	Improvement	Use for reliability improvements on worst-performing distribution circuits. Work includes fusing of lateral taps, coordination and re-fusing of existing fuse locations, and coordination and placement of single and three-phase reclosers.
		Line Operations Baxter	797,484.44		
		Line Operations Bolivar	425,097.53		
		Line Operations Branson	198,062.71		
		Line Operations Joplin	605,551.04		
		Line Operations Neosho	239,916.28		
		Line Operations Ozark	208,464.09		
	DR0009	Construction Design - West	-	Replenishment	Trended Budget Item. Project need for various rebuilds and additions to distribution substation facilities as needed.
		Substation Maintenance - East	2,303,502.86		
		Substation Maintenance - West	863,300.00		
	DR0010	Line Design Engineering	285,861.34	Replenishment	Trended budget item. Provide mitigated solutions on our aging infrastructure as required throughout the construction year.
		Line Operations Branson	33,409.11		
		Line Operations Joplin	39,059.51		
	DR0011	Construction Design - East	23,411.00	Replenishment	Replace underground cable that has reached the end of its useful life. Also, to treat existing underground cable to extend the useful life.
		Line Operations Aurora	324,648.32		
	DR0012	Line Operations Aurora	13,940.00	Replenishment	Provide solutions for attachment requests by communication companies on our overhead pole lines as required throughout the construction year.
	DR0020	(blank)	251,103.74	Improvement	Switch gear inside of #315 unable to be maintained or replacement parts to be obtained. Transformer is of unique vintage with no readily available system spare. Fault current within #315 switchgear building is very high which raises safety concerns should an arch flash event occur. Future benefits/gains will be realized in conjunction with TR-150 due to the double-circuit undrebuild of the transmission. This could develop either a dedicated feed to Solar or remove exposure to Solar by way of added circuitry.
	DR0099	Line Operations Joplin	230,000.00	Improvement	New breakers installed required due to lack of available parts and excessive maintenance of existing parts.
	DR0172	Line Operations Joplin	180,000.00	Improvement	Project planned for the replacement of series street lighting on the LU/EDE system. Lighting is replaced by service area, starting first with areas that have the smallest amount of series street lighting and eventually concluding with the area that has the largest amount of it.
	DR0176	Line Operations Joplin	499,516.02	Replenishment	Single location code issues require switchgear to be changed out as soon as possible. Other 3 locations to be changed out due to obsolete equipment.
		Substation Maintenance - West	465,000.00		

Sum of Best Estimate FERC Function	Budget	Department	Total	Category	Explanation
					The switchgear has had a recent history of not operating correctly thus causing an extended outage on portions of the mall. Line crews and substation crews are dispatched to restore the switchgear, typically with no problems found. When the switchgear is operated it has a tendency to not operate successfully on repeated operations. During an outage earlier in 2014 we performed maintenance on the switchgar but it did not improve the operation of the gear. The reliability of the service to the mall to allow for the automatic throwover would be increased and providing service as we normally have since the mall
	DR0184	Line Operations Joplin	384,000.00	Improvement	was built.
	DR0186	Line Operations Neosho	40,594.29	Improvement	Substation maintenance inspection has shown deteriorated structures in need of replacement. Upon review and considering a failure inside the substation, it was determined this could be a lengthy outage resulting in a negative impact to SAIDI and SAIFI.
		Substation Maintenance - West	-		
	DR0190	Substation Maintenance - East	-	Improvement	Project identified through sub maintenance efforts. Final result would establish the platform of a possible conversion of 34.5kV to 69kV sometime in the future. Current breakers are 45-65 years old and existing (3) 1-phase xfmrs are 75 years old. All useful life has been extinguished out of the existing infrastructure.
	DR0209	Line Design Engineering	-	Improvement	
		Substation Engineering	-		
	DR0211	Line Design Engineering	-	Improvement	
		Line Operations Aurora	34,317.27		
	DR0212	Line Design Engineering	3,319,406.67	Improvement	KANSAS PROJECTS
		Line Operations Baxter	339,525.86		
	DR0214	Line Design Engineering	-	Improvement	
		Line Operations Joplin	52,000.00		
	DR0216	Line Design Engineering	-	Improvement	
	DR0217	Line Design Engineering	-	Improvement	
	DR0930	Line Operations Aurora	110,164.05	Improvement	This is an Operation Toughen Up project that will increase customer service reliability. This work replaces deteriorated overhead conductor.
	DR0932	Line Design Engineering	238,952.32	Improvement	This is an Operation Toughen Up project that will improve service reliability. This conductor has been damaged from past storms and tree damage.
	DS0120	Line Operations Neosho	8,000.00	Improvement	Storage Facility Improvements and Additions
	DS0130	Building Services	50,000.00	Improvement	Service Center Improvements and Additions
		Land and Land Rights	100,000.00		
		Line Operations Aurora	40,000.00		
		Line Operations Baxter	5,943,865.48		
		Line Operations Bolivar	5,040,363.00		
		Line Operations Branson	136,663.56		
		Line Operations Neosho	1,066,552.81		
		Line Operations Ozark	92,863.77		
	DX	Line Operations Baxter	70,000.00	Growth	Customer Driven Projects
		Line Operations Joplin	3,000.00		
		Line Operations Neosho	83,250.00		
		(blank)	29,770.95		
	GA0006	Stores	34,046.32	Replenishment	
	GT0103	Line Operations Joplin	3,500.00	Replenishment	Purchase Test Equipment
		Line Operations Neosho	3,500.00		
	STORM JOBS	Engineering Office	-	Replenishment	Repairs/Replacements to system due to storm damage.
		Line Operations Joplin	672,403.88		
	TA0236	Substation Maintenance - East	325,429.83	Improvement	This project is a reliability improvement project. It will replace existing carrier and DIT tone with a point-to-point fiber optic connection between communication assisted protection schemes. This will provide a more secure and stable communication channel configured in a ring topology allowing for path rerouting in the event of a fiber break. SCADA reliability will be improved by having the Primary and Back-Up control centers on separate rings along with providing a more secure SCADA network. In addition, the ICON project will reduce the fiber pairs needed at various locations due to protective relaying needs. SCADA and protection will be multiplexed using one fiber optic pair. The ICON network satisfies NERC PRC-005-02 requirement to periodically test teleprotection schemes for channel integrity.
		Substation Maintenance - West	-		
	TA0925	Substation Maintenance - West	-	Improvement	This is an Operation Toughen-Up project that will enhance the sectionalization of the 21-0 transmission line, which will improve customer service reliability and reduce interruption risk. This will reduce SAIDI and SAIFI in the event of an outage.
	TA0927	Substation Maintenance - East	-	Improvement	This is an Operation Toughen-Up project. SCADA provides enhanced operational efficiency and the ability to remotely interogate substation real-time status information and control when needed. This information provides operational awareness which improves proactive decision making and can help reduce SAIDI and SAIFI.

Sum of Best Estimate FERC Function	Budget	Department	Total	Category	Explanation
Distribution Plant - Electric	**TA0927**	Substation Maintenance - West	-		
	TA0935	Substation Maintenance - East	793,219.07	Improvement	This is an Operation Toughen-Up project that will help sectionalize the transmission system between Monett #383 and Aurora #124. It will also allow the ability to automatically restore power to Monett #152 during outages on this line segment.
	TA0942	Line Design Engineering	-	Improvement	This is an Operation Toughen-Up project that will rebuild sub #291 and relocate sub #291 under our existing 161kV transmission line, thereby improving its resiliency and eliminating the present radially configured source. Further aspects will increase the resiliency of the distribution emminating from the newly constructed substation site and integrate into existing infrastructure.
		Substation Engineering	-		
	TR0001	Line Operations Neosho	42,000.00	Replenishment	Routine annual reliability inspection to replace or restore structurally inadequate poles identified.
	TR0901	Substation Maintenance - West	-	Improvement	This project is a portion of Operation Toughen Up and the final component of the 27-0 transmission line rebuild. Voltage conversion provides multiple benefits; improved reliability, standardized spare substation equipment, greater power availability, and retirement of deteriorated assets. Aged and deteriorated insulators and 69/34.5 kV transformers within Baxter Springs #271 will be taken out of service as a portion of this project.
Distribution Plant - Electric Total			**78,028,003.36**		
Transmission Plant - Electric	**CG0000**	Default	-		
	DA0151	Line Design Engineering	2,301,980.42	Growth	Peak loading in 2010 on bank #1 at Willard #369 reached 9.1 MW and bank #2 reached 9.3 MW. In the event of losing either transformer bank as experienced in 2012, alternate bank would not be able to serve existing load. In 2012, a mobile transformer was dedicated to Willard #369 for approximately 7 months in order to sustain Willard area load. A new sub would alleviate loading on both banks (depending on distribution circuit configuration) to allow for more switching flexibility if an outage is experienced. Presently, Willard #369 is served off a radial 69kV line with auto throw-over capability. Building a new sub and looping transmission would allow for continuous service during an extended transmission outage and will eliminate the time between an opertaion of the auto-throw system. Breakers would better sectionalize the transmission and would conform to the reliability methodology of a single throw-over scheme in a particular line section.
		Substation Maintenance - East	637,000.00		
	DA0154	Line Design Engineering	278,641.12	Growth	Will alleviate loading on Sub #438, #413, #387 Branson area xfmrs, which will allow for alleviation of the northern corridor of Branson area substations. Peak loading values for 3 directly affected substations are as follows: #413 - 49.4 MVA [14.4+17.7+17.3] (2014) #387 - 22.1 MVA (2014); #438 - 24.0 MVA (2014) Presently, no switching flexibility is available on Hollister Sub #387 or Riverside #438 during peak loading conditions under various single contingency scenarios. Switching flexibility will greatly increase and will poise Empire to readily absorb growth and load development in/around the Branson Creek & Hollister Industiral Park areas. Transmission is readily available in the immediate area and will benefit from improvements slotted for Hollister #387 breaker install project, scheduled in 2017.
	DA0166	Line Operations Neosho	49,024.25	Growth	This project was a direct result of a customer expansion project in the Neosho, MO area, however the project also was scoped to allow for future expansion and load growth opportunities within the co-located industrial park. Empire was approached in Q2 of 2018 with the possibility of expanding operations at the present Praxaire location in the industrial park of Neosho, MO. Empire met with the customer multiple times to discuss the specifics of load to be added (machine and motor types) and present demand/usage. The proposed additional load was approx. 4 MW with unknown reactive power demands. The existing transformer loading of 8.5MW on a the station transformer rated at 10.5MVA FOFA evidenced the need for additional capacity to serve the proposed 4MW. Furthermore, it was determined that due to the peak demand requirements for the large motors already present and lack of motor starting capabilities at other substation sites within the Neosho area paired with the additional exposure if an offsite substation location were chosen, that an expansion project would be required to serve the additional load. By expanding capacity at the already present substation for Praxaire (#314 Linde), there were three readily identified benefits to the Neosho area: (1) The customer could expand operations as proposed, (2) utilizing the existing infrastructure dedicated to Praxaire would insulate residential customers from voltage depression incidents due to the high demand placed on infrastructure during the large motor starting events, (3) position the industrial park for future growth, while increasing reliability by establishing a location for a future 69kV loop tie. Multiple project scopes were vetted in an attempt to directly serve the customer expansion and as a result, a new ring bus configuration and additional transformer was determined to meet the needs of not only the customer's expansion project, but also to allow for future looping of the 69kV system.
	DB0006	Meter Shop	158,131.22	Growth	Planned or unplanned installation/removal or replacement of distribution meters as needed across system.
	DB0008	Substation Maintenance - West	2,000.00	Improvement	Planned or unplanned installation/removal or replacement of equipment needed within substations across system as needed.
	DR0001	Line Design Engineering	464,277.63	Replenishment	Trended budget item required for city and state road moves. In some years, if there are scoped/known projects, dollars may be budgeted in addition to the trend.
		Line Operations Baxter	330,336.44		
		Line Operations Neosho	49,342.87		

Sum of Best Estimate FERC Function	Budget	Department	Total	Category	Explanation
	DR0009	Substation Maintenance - West	70,000.00	Replenishment	Trended Budget Item. Project need for various rebuilds and additions to distribution substation facilities as needed.
	DR0020	Line Design Engineering	8,088.21	Improvement	Switch gear inside of #315 unable to be maintained or replacement parts to be obtained. Transformer is of unique vintage with no readily available system spare. Fault current within #315 switchgear building is very high which raises safety concerns should an arch flash event occur. Future benefits/gains will be realized in conjunction with TR-150 due to the double-circuit undrebuild of the transmission. This could develop either a dedicated feed to Solar or remove exposure to Solar by way of added circuitry.
	DR0196	Substation Maintenance - East	-	Improvement	Bus work and disconnect switches are undersized to be able to utilize the capacity out of xfmr. 12kV breakers are of an age where they cannot readily accept needed SCADA and metering equipment. Replacement is required which will upgarde relaying and accomplish SCADA needs.
	DR0217	Line Design Engineering	1,867,000.00	Improvement	
	GT0010	Relay	36,000.00	Replenishment	Purchase Miscellaneous Tools
	NG0021	Energy Supply Services	-		
		Line Design Engineering	144,000.00		
	PIC001	ES Iatan Common Property	11,043.11		
	STORM JOBS	Line Operations Joplin	-	Replenishment	Repairs/Replacements to system due to storm damage.
	TA0236	Substation Maintenance - East	654,630.90	Improvement	This project is a reliability improvement project. It will replace existing carrier and DIT tone with a point-to-point fiber optic connection between communication assisted protection schemes. This will provide a more secure and stable communication channel configured in a ring topology allowing for path rerouting in the event of a fiber break. SCADA reliability will be improved by having the Primary and Back-Up control centers on separate rings along with providing a more secure SCADA network. In addition, the ICON project will reduce the fiber pairs needed at various locations due to protective relaying needs. SCADA and protection will be multiplexed using one fiber optic pair. The ICON network satisfies NERC PRC-005-02 requirement to periodically test teleprotection schemes for channel integrity.
		Substation Maintenance - West	41,148.00		
	TA0238	Substation Maintenance - West	1,209,075.00	Improvement	DFR at #452 will be completed under TR-119. Project scoped for compliance with PRC-002. Six sites required for DFR installation per Attachement B, which specifies sites and number of required installs. Sites also selected to give best visiblity across the system should a fault occur.
		(blank)	653,925.00		
	TA0240	Substation Maintenance - East	-	Improvement	This project is driven by breaker and relaying upgrades at #312. It also prepares the line section for breakers to be added at #331 due to substation infrastructure upgrades needed. Future project yet to be identified will install breakers at #331.
	TA0923	Substation Maintenance - West	-	Improvement	This project is an Operation Toughen-Up reliability improvement project. It will reduce the line exposure of Gateway #258 and minimize the momentary and permanent outages. This will improve the SAIDI and SAIFI performance.
	TA0924	- Unknown	1,549,000.00	Improvement	This project was highlighted by Substation Operations due to outage events occurring in 2017. Project was expanded due to flooding washout, existing hardware operability issues, and transformer oil containment needed. The existing switches were noted as needing to be replaced, which also required the structure to be replaced. This project will improve SAIDI and SAIFI performance.
	TA0926	Line Design Engineering	323,712.27	Improvement	This is an Operation Toughen-Up project that will enhance the sectionalization of the 29-0 transmission line, which will improve customer service reliability and reduce interruption risk. This will reduce SAIDI and SAIFI in the event of an outage. Telecomm to establish fiber connection to substation in first half of 2019. Control panel for switching scheme will be located within sub #278. Fiber control/Comm to switching scheme will cross railroad on existing transmission crossing as will 7.2kV to power switching scheme. Switching scheme will consist of (1) 3-way switch.
		Substation Maintenance - West	627,186.45		
	TA0928	Substation Maintenance - West	-	Improvement	This is an Operation Toughen Up project that will enhance the sectionalization of the 84-0 transmission line, which will improve customer service reliability and reduce interruption risk. This will reduce SAIDI and SAIFI in the event of an outage.
	TA0929	Line Design Engineering	298,121.52	Improvement	This is an Operation Toughen-Up project that will help sectionalize the transmission system between Monett #383 and Wentworth #205. It will also allow the ability to automatically restore power to Pierce City #460 during outages on this line segment. (2) New switching structures position immediately north of sub. Existing 69kV switches will be repurposed at site yet to be determined.
		Substation Maintenance - East	318,230.98		
	TA0932	Substation Maintenance - East	3,527,191.54	Improvement	This is an Operation Toughen Up project that will enhance the sectionalization of the 89-0 transmission line, which will improve customer service reliability and reduce interruption risk. This will reduce SAIDI and SAIFI in the event of an outage.

Sum of Best Estimate FERC Function	Budget	Department	Total	Category	Explanation
	TA0934	Substation Maintenance - West	2,501,176.84	Improvement	This is an Operation Toughen Up project that will enhance the sectionalization of the 84-0 transmission line, which will improve customer service reliability and reduce interruption risk. This will reduce SAIDI and SAIFI in the event of an outage. Coordination with SPA for what protection comm platform will be used (upgrade to fiber comm if SPA agrees).
	TA0935	Line Design Engineering	183,229.55	Improvement	This is an Operation Toughen-Up project that will help sectionalize the transmission system between Monett #383 and Aurora #124. It will also allow the ability to automatically restore power to Monett #152 during outages on this line segment.
	TA0936	Substation Maintenance - West	-	Improvement	Project will provide positive impacts to multiple substations which are either landlocked or are experiencing high load conditions during peak load scenarios. A lack of alternate source options cause inabilities for Operations to be able to switch load to relieve feeders. Inadvertent tripping of equipment has occurred under high loading which further restrict restoration efforts. Impacted substations include: 432, 105, 436, 421, 108, 110, 360, 109, 395. Specifically 432 with radial industrial feeders without options for switching, 105, 436 & 421 have shown Winter loading issues without switching options, trip events and conductor issues, 108 impacted via 421 ability to switch load for voltage profile issues, 110 & 360 relief needed and radially fed industrial (Tamko), reduce exposure on 109 & 395 ckt's which extend far beyond reasonability for adequate service. The installment of additional capacity at Sub #432 and circuitry to connect to existing infrastructure will allow for alleviation of the above mentioned substations and result in the ability to provide flexibility, redundancy, and resiliency to the Webb City , Purcell, and North Joplin areas.
	TA0938	Line Operations Joplin	1,728,000.00	Improvement	This is an Operation Toughen-Up project to reduce SAIFI and SAIDI. It will reduce the substations exposure, minimize the momentary outages, and allow for future intermediate switching points within the transmission line segments.
	TA0941	Line Design Engineering	1,239,957.22	Improvement	This is an Operation Toughen-Up project that will improve service reliability for our largest wholesale customer. This project will automatically isolate and restore 69kV transmission service for the city of Monett.
		Substation Maintenance - East	-		
	TA0942	Line Design Engineering	-	Improvement	This is an Operation Toughen-Up project that will rebuild sub #291 and relocate sub #291 under our existing 161kV transmission line, thereby improving its resiliency and eliminating the present radially configured source. Further aspects will increase the resiliency of the distribution emminating from the newly constructed substation site and integrate into existing infrastructure.
	TA0943	Line Design Engineering	177,575.65	Improvement	This is an Operation Toughen-Up project that will enhance the sectionalization of the 35-0 line which will improve customer service reliability and improve interruption risk. Empire owns property at the corner of Crow Rd. and Kentucky. This location will be used for the control equipment.
		Substation Maintenance - West	-		
	TA0944	Substation Maintenance - East	683,461.16	Improvement	These 2 lines panels are upgrades and replacements of existing relaying due to breaker replacements and transmission sectionalization projects on either end of these terminals. 16120 line panel is an MDAR replacement project. Originally under TR-113, but moved and combined with 16118 to accomplish work at sub #110 in an effort to minimalize outages required and find efficiencies in work processes. Breaker 16118 was replaced under the 'Underrated Device' under TR-049. Replacing this line panel will be in unison to breaker additions at Oakland #432.
	TR0001	Line Design Engineering	87,210.90	Replenishment	Routine annual reliability inspection to replace or restore structurally inadequate poles identified.
		Line Operations Aurora	1,030,303.87		
		Line Operations Baxter	440,606.59		
		Line Operations Bolivar	365,125.79		
		Line Operations Joplin	416,642.99		
		Line Operations Neosho	30,676.80		
		Line Operations Ozark	200,300.00		
	TR0009	Meter Shop	148,934.00	Replenishment	Trended budget item. This budget item is used to replace failed transmission equipment in the substation that occur during the year.
		Substation Maintenance - East	857,596.38		
		Substation Maintenance - West	601,023.00		
	TR0010	Land and Land Rights	7,500.00	Replenishment	Trended budget item. Rebuild transmission structures and poles identified throughout the year due to failures, discovered potential failures or other required line moves.
		Line Design Engineering	559,943.57		
		Line Operations Aurora	7,000.00		
		Line Operations Baxter	155,736.58		
		Line Operations Bolivar	2,895.87		
		Line Operations Joplin	132,000.00		
		Line Operations Ozark	43,336.12		
		(blank)	29,624.82		

Sum of Best Estimate FERC Function	Budget	Department	Total	Category	Explanation
					Present configuration of bus work in Sub #184 has elevated exposure on which (2) 161kV terminals are connected, (3) auto xfmrs, (1) distribution xfmr, & (5) 69kV line terminals are connected. An ill-placed fault could result in the entire station clearing, thereby impacting the reliability of the Neosho area customers and causing undesired disconnectivity. The use of bus differentials by way of microprocessor relaying will aid in troubleshooting efforts and recording capabilities that are not presently available which hinder restoration efforts. Project dependent on auto upgrade at #452 in budget TR-119 to occur in same year. Provisions made for a possible future line to Linde #314. Land required to be acquired to North side of sub (approx. 1 acre). This will allow the newly positioned 69kV ring bus line getaways to exit sub and interconnect with existing infrastructure.
	TR0014	Substation Maintenance - West	-	Improvement	
	TR0049	Substation Maintenance - East	207,755.26	Improvement	Underrated interrupting devices discovered during system fault duty analysis.
	TR0113	Substation Engineering	-	Improvement	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 EDE standard SEL-421/311L panel.
		Substation Maintenance - West	338,800.00		
	TR0115	Substation Maintenance - East	1,441,508.52	Growth	The project at Riverside #438 is required to get the full benefit of the upgrades in coordination with TA-932 and DA-154.
	TR0119	Line Design Engineering	3,374,000.00	Improvement	Multiple upgrades at multiple substations needed in lieu of South Joplin 161kV conversion project. Due to increase generation on the west side of the EDE transmission system along with load remaining on the 69kV system, upgrades to the Joplin 69kV corridors and terminal equipment are needed to incorporate higher flows under contingency scenarios. Presently, terminal equipment being addressed to increase ratings as high as possible before line ratings are exceeded and become limiting elements for specific facility ratings. As load increases and generation profiles change, substantial future line reconductors will be needed on the 69kV system in the immediate Joplin area.
	TR0120	Substation Maintenance - East	55,000.00	Improvement	Line ratings shown to become exceeded in load flow models.
	TR0124	Line Design Engineering	541,487.78	Improvement	Project added due to SPP Transmission Expansion Plan. An NTC for this project was received as SPP models showed contingencies with loss of transmission support from the west cause this section of line to overload.
	TR0134	Line Design Engineering	-	Improvement	This line was built in 1928 and now equipment is nearing 100 years old and is difficult to repair. Present conductor is sagged beyond it's useful life and has experienced clearance issues that have been addressed individually over the years.
		Line Operations Baxter	385,148.38		
		Line Operations Joplin	1,886,849.93		
	TR0136	Line Operations Baxter	2,620,803.41	Replenishment	Tower foundations have deteriorated due to mining activities and flooding of mining pits. Foundations non-existant at this point and towers are unsupported. They are unable to be maintained due to condition and location because of swampy conditions in the remidiation area. This rebuild will incorporate upgrades needed for longstanding flowgate to be upgraded in a future project determined by an SPP analysis. This project will focus on how to replace (2) double circuit transmission towers currently located in a strip pit lake. These towers are inaccessible and are unrepairable. Further, in future years it is proposed that this line be upgraded due to age and power flow. This proposal will relocate the 69kv line starting near the intersection of 70th Street and Center Star Road in Cherokee County, Kansas to go either north along 70th street and then west along Bellview Road or west along Center Star Road and then north along 90th Street. By keeping the 161kv line in its present location we will be able to utilize the existing 100 ft right-of-way and reduce cost by keep that line as straight as possible. Atypical structures may need to be used if the new foundation of the structures are to remain submerged. Sub 425 is radially fed from the 69kv line, however, the load can be switched to other substations via distribution circuitry. Wood poles should be given priority for this reason. The 69kv transmission conductor should be 556 AA/ACSR with 80 ACSR static or 3/8 EHS, the 161kv structures should be designed for bundled 1192 ACSR with 144 ct OPGW.
	TR0142	Line Operations Joplin	839,000.00	Improvement	Project need resulted from request from tie lie upgrades at AECI's Morgan substation. Present relaying would not provide adequate protection for the short line section and required upgrades on the Liberty end of line. Project has been communicated with tie utility and will bolster the support to the Liberty transmission system. Tie line is strong source into the area and supports voltage in/around the Bolivar area.

Sum of Best Estimate FERC Function	Budget	Department	Total	Category	Explanation
Transmission Plant - Electric	**TR0146**	Line Design Engineering Substation Maintenance - East	346,429.82 733,600.00	Improvement	This project replaces the existing, non-operational xfer scheme. The present inability to sectionalize the local 69kV transmission system results in the loss of 3 substations if a fault occurs in any of the approx. 30 miles of line exposure. A recent fault occurred in April of '18 and resulted in a transmission outage to the aforementioned 3 substations and due to the remote location of the Buffalo substations, the restoration efforts were much longer. Due to the lack of SCADA present at this substation further complicated restoration due to the inability to view/confirm what elements had opened and what customers were outaged. This episode highlighted the exposure, the length of restoration from a fault, and the inability to confirm the system condition during an outage event. The System Performance dept has run an analysis on the need rankings using associated metrics including number of customers impacted and amount of exposure present. This analysis resulted in this project rising to the top of the rankings for needed upgrades to the area. This project scope was vetted against other techniques for sectionalizing the nearby area transmission and a replacement of the existing xfer scheme was deemed the most cost effective/appropriate solution to realize benefits to the customers in the NE corner of the Liberty transmission system.
	TR0152	Line Design Engineering	-	Improvement	This project, in conjunction with TR-154, establishes a fiber connection from the Neosho Area (Neosho ICON ring to be established in TA-238) to the AR area customers. This project will allow for the development of a more robust/new communications platform on which future deployments of communications can be realized, such as AMI, SCADA expansion, relaying upgrades, and substation access permissions. The present lack of communications to the areas south of the Neosho area inhibit the ability to properly clear transmission line faults, obtain loading data, and System Operations' SCADA during system events.
	TR0154	Line Design Engineering	-	Improvement	This project, in conjunction with TR-152, establishes a fiber connection from the Neosho Area (Neosho ICON ring to be established in TA-238) to the AR area customers. This project will allow for the development of a more robust/new communications platform on which future deployments of communications can be realized, such as AMI, SCADA expansion, relaying upgrades, and substation access permissions. The present lack of communications to the areas south of the Neosho area inhibit the ability to properly clear transmission line faults, obtain loading data, and System Operations' SCADA during system events.
	TR0901	Line Operations Baxter Substation Maintenance - West	28,130.99 -	Improvement	This project is a portion of Operation Toughen Up and the final component of the 27-0 transmission line rebuild. Voltage conversion provides multiple benefits; improved reliability, standardized spare substation equipment, greater power availability, and retirement of deteriorated assets. Aged and deteriorated insulators and 69/34.5 kV transformers within Baxter Springs #271 will be taken out of service as a portion of this project.
	TR0910	Line Design Engineering	-	Improvement	Reliability improvement due to aged and deteriorating line. Multiple cross-arm failures have resulted in increased O&M cost. Average age of the line is 70+ years and replacement is recommended. The intention of the design for all 3 phases is to have a 500 ft ruling span for the transmission and a 250 ft ruling span for the distribution. All poles are to be designed for the following; 556 Dove transmission (Constructed), 144 ct OPGW (constructed), 336 ACSR Merlin Distribution and 4/0 neutral (only constructed on Phase 1 but designed throughout). NESC grade B design considerations. With the system being dual fed the primary pole material shall be wood up to and including 80ft, past 80ft the poles should be steel. Steel poles should be used for all transmission switches. All switches are to meet the following criteria: 1200-Amp rating, include Vacuum interrupters, have fault sensors located on each phase on each line segment (9 total), be either single pole 1-way switches (4 total) OR 2) 3-way switches. The motor operation will only be used for the line paths and not the taps to Golden City or Lockwood.
Transmission Plant - Electric Total			**40,037,458.70**		
Grand Total			**118,065,462.06**		

AFFIDAVIT OF JEFF WESTFALL

STATE OF MISSOURI)
) ss
COUNTY OF JASPER)

On the 8 day of August, 2019, before me appeared Jeff Westfall, to me personally known, who, being by me first duly sworn, states that he is the Central Region Director of Transmission and Distribution of The Empire District Electric Company – Liberty Utilities Central and acknowledges that he has read the above and foregoing document and believes that the statements therein are true and correct to the best of his information, knowledge and belief.

Jeff Westfall

Subscribed and sworn to before me this 8 day of August, 2019.

ANGELA M. CLOVEN
Notary Public - Notary Seal
State of Missouri
Commissioned for Jasper County
My Commission Expires: November 01, 2019
Commission Number: 15262659

Notary Public

My commission expires: 11/01/19.