BEFORE THE

LOUISIANA PUBLIC SERVICE COMMISSION

ENTERGY LOUISIANA, LLC, *EX PARTE*. APPLICATION OF ENTERGY LOUISIANA, LLC FOR EXTENSION AND MODIFICATION OF FORMULA RATE PLAN	**)**	**DOCKET NO. U-_____**

DIRECT TESTIMONY

OF

ANTHONY P. ARNOULD, JR.

ON BEHALF OF

ENTERGY LOUISIANA, LLC

PUBLIC VERSION

MAY 2020

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EXHIBITS

I. INTRODUCTION

Q1. PLEASE STATE YOUR NAME, POSITION, AND BUSINESS ADDRESS.

A. My name is Anthony P. Arnould, Jr. I am employed by Entergy Louisiana, LLC ("ELL" or the "Company") as Senior Manager, Regional Customer Service. My business address is 303 North Ryan Street, Lake Charles, LA 70601.

Q2. ON WHOSE BEHALF ARE YOU TESTIFYING?

A. I am submitting this written testimony before the Louisiana Public Service Commission ("LPSC" or the "Commission") on behalf of the Company in support of its application ("Application") to extend, and amend, its existing Formula Rate Plan ("FRP").

Q3. PLEASE PROVIDE AN OVERVIEW OF YOUR EDUCATIONAL, PROFESSIONAL, AND BUSINESS EXPERIENCE.

A. I earned a Bachelor of Science degree in Electrical Engineering and Master of Business Administration degree from Louisiana State University in 1999 and 2013, respectively. I have held several engineering positions with the Entergy Operating Companies and Entergy Services, LLC ("ESL"), including in the areas of Transmission, Distribution, Customer Service, Industrial Accounts, Substation, and Operations.

From 2000 to 2007, I supported Substation and Relay, Transmission Lines, and Distribution Design as a Field Engineer. In these roles, my responsibilities included providing technical support as well as analyzing results from maintenance tests, designing and supporting substation equipment and breaker replacements, relay replacements and the replacement of remote terminal units for data acquisition and control of devices. I also

performed aerial inspection of transmission facilities and designed and supported the construction of projects for maintenance and system upgrades. While in the Distribution organization during this time, I was responsible for the design of customer-specific work including serving individual customers, new residential and commercial developments, and private area lighting, as well as outage mitigation plans. I also served on a variety of purchasing and design standard committees for the Entergy system.

In 2007, I was promoted to Area Design Manager, Distribution. In this role, I supervised a staff of engineers, engineering assistants, and support positions. My workgroup was responsible for the Distribution Design activities in the West Region of Louisiana. My responsibilities included management of the department spending and working with Customer Service and Business Development groups to provide costs and designs to commercial and residential customers and developers. I coordinated vendor training for design and operation workgroups. I also assessed and evaluated proposed projects, ensuring coordination with operations and regulatory workgroups to improve infrastructure and reliability throughout the region.

In 2011, I became the ELL Regional Customer Service Manager in the West Region.[1] In that role, my workgroup was responsible for investigating and resolving the concerns of residential and small business customers. Also, I served as a liaison to local government and elected officials and supported media relations and customer communication within the region. Additionally, during this time, I led a system effort to

[1] The ELL-West Region is headquartered in Lake Charles and generally described as West of the Atchafalaya Basin to the Texas border and South of US-190 to the Gulf Coast. A map of the West Region and the other geographic regions served by ELL is provided in Figure 1 of my testimony.

develop a messaging system to keep the public informed of restoration progress following major events.

In January of 2014, I became Area Substation Supervisor for ELL. In this role, I supervised a group of employees as well as contractors that performed maintenance of ELL's Substation and Relay equipment in the West Region. I also served as the jurisdictional expert for the Project Management and Construction organization during the scoping, design, and execution of capital projects, including infrastructure upgrades and emergency failure replacements within the region.

In August of 2014, I became Sr. Manager of Industrial Accounts for ELL and became responsible for managing positive relationships with the Company's industrial customers, including, among other things, providing oversight for negotiating and managing the commercial terms of sales and service contracts. Since 2016, I have served as the West Region Sr. Manager of Customer Service. My current responsibilities include managing distribution operations and coordinating engineering and customer service efforts for the West Region.

Q4. DO YOU SPONSOR ANY EXHIBITS?

A. Yes. A listing of the exhibits I sponsor in support of my Direct Testimony may be found following the Table of Contents.

II. PURPOSE OF TESTIMONY

Q5. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A. My direct testimony supports the Company's Application in this proceeding, which seeks, among other things, approval to both extend, and amend, its existing FRP. In particular, my testimony describes the nature and benefits of ELL's contemplated near-term distribution plan for its service area, which forms the basis for the Company's request for Commission approval to implement the Distribution Recovery Mechanism ("DRM") described further in the direct testimony of Company witness Mr. Joshua B. Thomas. I describe some historic examples of the types of projects ELL has already undertaken to improve its distribution system and the significant reliability benefits those projects produced. These historic examples provide helpful context for the kinds of distribution infrastructure upgrades ELL plans to deploy in the near-term to modernize its distribution system and the expected benefits of such improvements on ELL's service quality.

Q6. HOW IS THE REMAINDER OF YOUR TESTIMONY STRUCTURED?

A. In Section III, I provide an overview of the evolution and current state of ELL's distribution system, and I describe the Distribution Operations Organization, which is responsible for planning, constructing, operating, and maintaining ELL's electric distribution system. In Section IV, I discuss ELL's distribution capital investment levels, focusing particularly on steady increases in historical and forecasted investment levels during the ten-year period beginning in 2013. I provide details about the causes of this upward trend in distribution investment, including, most notably, ELL's ongoing plan to improve the reliability and resiliency of its distribution system. Finally, Section V of my testimony introduces and

discusses a proposal to coordinate with grid upgrades over the next three years the removal of trees located outside of ELL's rights-of-way ("ROW") that pose threats to reliability (referred to herein as the "OROW" proposal).

Q7. WILL YOU BE TESTIFYING ON TRANSMISSION AS WELL AS DISTRIBUTION?

A. The primary focus of my testimony is to describe ELL's distribution operations and its distribution plan to enhance its service quality. However, the OROW proposal discussed in Section V includes removal of vegetation near ELL's transmission system (in addition to removal of vegetation near ELL's distribution system) in order to produce long-term cost-savings and efficiencies. Beyond the OROW vegetation removal program, Mr. Thomas addresses costs associated with ELL's Transmission Operations assets and projected transmission upgrades.

III. ELL'S DISTRIBUTION SYSTEM & OPERATIONS

A. Evolution and Status of ELL's Distribution System

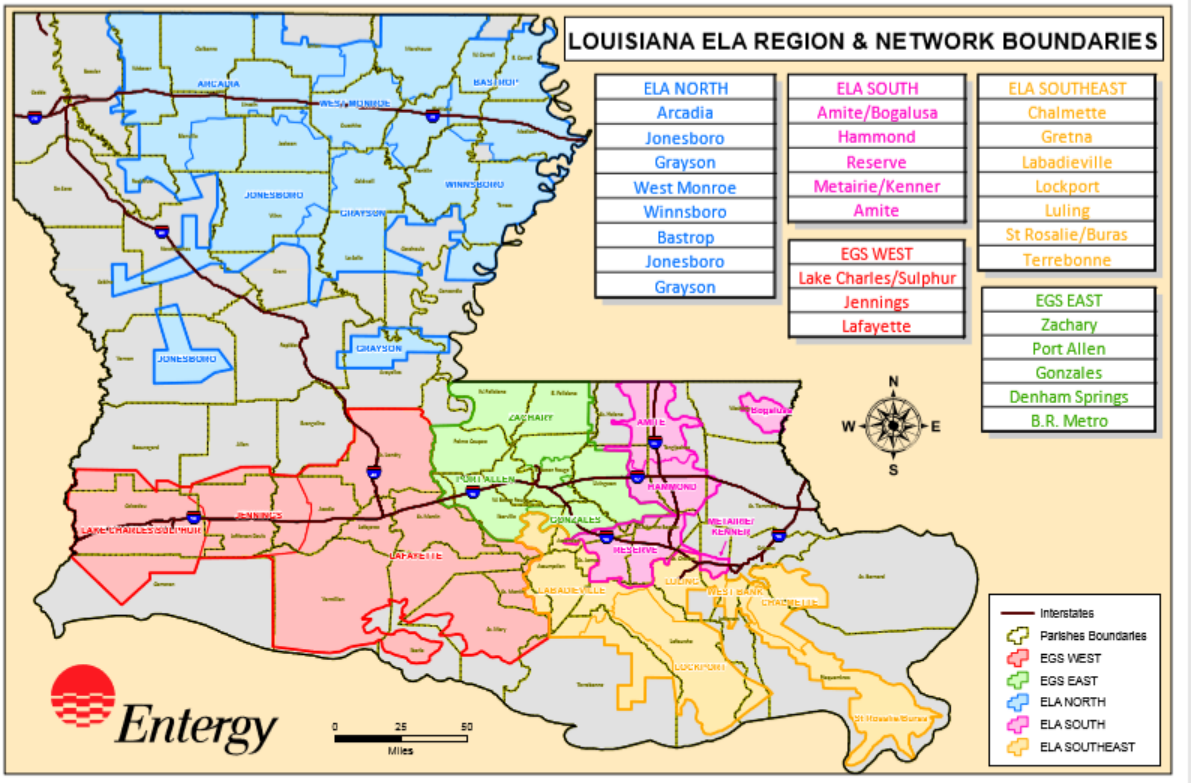
Q8. PLEASE DESCRIBE ELL'S DISTRIBUTION SYSTEM AND THE GENERAL FUNCTION IT SERVES.

A. The distribution system is the infrastructure that ultimately delivers electric power to most of ELL's customers. ELL's distribution system begins at the substations, where power is transformed from transmission-level voltage into distribution-level voltage, suitable for delivering power directly to residential, and certain commercial, governmental, and

industrial customers.[2] ELL's electric distribution system is the portion of the electric grid operating at voltage levels below 69,000 volts (69 kV). ELL's distribution system serves nearly 1.1 million customers. There are nearly 500 ELL substations that supply power to approximately 1,200 distribution circuits, consisting of over 32,000 distribution circuit miles, of which approximately 28,000 are overhead circuit miles, and approximately 4,000 are underground circuit miles.

ELL is geographically divided into 5 regions consisting of 28 networks, and their respective geographical boundaries are depicted in the map in Figure 1.

Figure 1
Map of ELL's Geographical Regions



[2] Some of ELL's largest commercial, governmental, and industrial customers are connected directly to the Company's transmission system.

Q9. WHAT IS THE STATUS OF ELL'S DISTRIBUTION SYSTEM??

A. Like many of its utility peers, ELL has an aging distribution system that now is in a period of significant modernization as it evolves to address changes in customer expectations and grid technologies. Historically, ELL's distribution system served the primary purpose of delivering energy from large substations to end-use customers throughout a widespread service area that expanded and changed over time. Energy was delivered to those substations solely from large generating units, located near the center of the load area, via the transmission system. Under this traditional configuration, distribution planning has been conducted from a "top-down" lens – facilitating the delivery of energy safely from these central locations to customers' premises. As a result, the distribution grid power-flow has historically been in one direction (to the customer) and served almost exclusively by ELL. However, as technologies have evolved, new distributed energy resources ("DERs") like rooftop solar have created instances of localized power flowing back onto the grid. The number of DERs and other technologies that affect and interact with a utility's distribution system is expected to continue to increase. As application and use of these technologies grow, it further increases the need for utilities to be more adaptive to accommodate new dynamics such as two-way power flow.

Q10. WHAT IS NECESSARY TO RESPOND TO THIS EVOLUTION IN THE WAY POWER FLOWS ON THE GRID?

A. To accommodate and control bi-directional power flows, the grid must become "smarter" and more flexible. The Commission's recent approval of ELL's Advanced Metering

System (referred to herein as "AMS")[3] has established a foundation for a holistic distribution plan that incorporates the latest technologies and establishes a more advanced way of maintaining and operating the distribution grid. For example, the Company's ongoing grid modernization investments enable two-way communications and automation, which, in turn are expected to facilitate numerous additional functionalities that will be developed in the future. These investments are also expected to provide additional information that ultimately improves reliability benefits over and above the traditional distribution reliability programs that I describe below.

Q11. WHAT DO YOU MEAN BY THE TERM GRID MODERNIZATION?

A. Grid modernization refers to upgrading and redesigning distribution infrastructure while also adding new technologies and intelligent devices that facilitate safe multi-directional energy flows, automate operations, enable remote control, increase operational efficiency, improve quality of service, increase reliability and resiliency, and expand options for customers. Grid modernization is a fundamental change to the way electric utilities evaluate, invest in, operate, and maintain the distribution system, while monitoring and responding to the rapid pace of technological innovations and evolution of customer needs and expectations. This change involves adopting a more customer-centric strategy for designing and maintaining the distribution grid, one which seeks to minimize interruptions experienced by customers regardless of fluctuating conditions on the distribution system. Grid modernization also involves expanding the functionalities offered by the distribution

[3] LPSC Order No. U-34320, *In Re: Application of Entergy Louisiana, LLC for Approval to Implement a Permanent Advanced Metering System and Request for Cost Recovery and Related Relief*, dated August 25, 2017.

grid in a manner that increases customers' choices for meeting their energy needs and that provides all customers with access to the benefits of technological innovation.

Q12. PLEASE ELABORATE ON HOW THIS MORE CUSTOMER-CENTRIC STRATEGY MARKS A FUNDAMENTAL CHANGE FROM THE INDUSTRY'S TRADITIONAL APPROACH TO DISTRIBUTION ASSET MANAGEMENT.

A. Although there have certainly been exceptions over time, the electric utility industry traditionally has not replaced or reconfigured distribution assets until they fail. This approach has been considered cost-effective for customers and reflects the balance that utilities must strike between reliability and cost. As I indicated above, however, the industry is evolving and modifying that approach by deploying new technology and preventive elements. This new approach is being enabled by new technology and developed in response to increasing customer expectations for reliability enhancements that require a more modern, responsive, and resilient grid to minimize the frequency and duration of outages. Toward that end, as described further below, ELL has developed and is deploying a distribution plan to further enhance its reliability performance in order to improve the service quality provided to customers.

Q13. HAS ELL TRADITIONALLY PROVIDED RELIABLE SERVICE?

A. Yes. In its General Order of April 30, 1998, issued in Docket No. U-22389, the Commission set minimum distribution reliability performance standards that were phased-

in over a period of seven years to reach the current metrics: an annual SAIFI[4] score of 2.28 and an annual SAIDI[5] score of 2.87 hours, or 172.2 minutes. In the two decades since that order was issued, ELL consistently exceeded the LPSC's minimum performance levels. ELL's SAIFI score was significantly lower (and therefore better) than the LPSC's minimum performance level in each year. More recently, however, ELL's SAIDI score increased from 2.72 hours (163.3 minutes) in 2017 to 3.57 hours (214 minutes) in 2018. Although ELL's SAIDI score for 2019, 3.02 hours (181.2 minutes), also did not meet the minimum performance level, it marked a 15% improvement over 2018. Overall, ELL continues to provide reliable service, but it also is in a transformative period during which it must increase its investment in the distribution system to maintain reliable service in the future, in addition to fulfilling the grid modernization objectives I have described.

Q14. WHAT DO ELL'S RECENT SAIDI SCORES INDICATE?

A. Those scores indicate that the Company has more work to do to improve its distribution system. However, those scores also are impacted by changes that ELL is making to modernize the system and to improve worker safety. The highest contributing outage categories to both frequency and duration of customer interruptions in 2018 and 2019 were

[4] SAIFI, which stands for System Average Interruption Frequency Index, is used to measure the number of outages or interruptions per customer per year. Most electric utilities use this measurement as a tool to assess the reliability of their electrical system, excluding major outage events that cause interruptions to a significant portion of their customer base. SAIFI is calculated by adding up the number of customers experiencing a sustained outage longer than 5 minutes during the reporting period and then dividing it by the average annual number of electric customers.

[5] SAIDI, which stands for System Average Interruption Duration Index, measures the number of outage minutes per customer per year. Most utilities also use this measurement when reviewing the reliability of their electrical system, excluding outage events that cause interruptions to a significant portion of their customer base due to extreme weather or unusual events. SAIDI is calculated by adding up the outage minutes of all the customers that have been without power during a sustained outage longer than 5 minutes and then dividing by the average annual number of electric customers.

consistent with historical interruption patterns, including primary conductor equipment failure, the presence of vegetation from outside of ELL's ROW falling onto the Company's distribution lines, lightning, and vehicle incidents. An important difference in 2018 and 2019 over prior years, however, was fewer events that met the Major Event exclusion of the Commission's General Order.[6]

The Company has developed a proposal to significantly reduce the amount of customer interruptions caused by OROW vegetation, as discussed further in Section V of my testimony. Also, through deployment of Distribution Automation ("DA") and the sectionalizing program that I discuss further in Section III, ELL has installed and continues to install devices on targeted circuits that automatically isolate and potentially re-energize undamaged sections of a feeder after a disturbance. Those devices minimize the impact of an outage by decreasing the number of affected customers. Because the number of customers affected is reduced and the duration of outages is minimized, fewer events are excluded from reporting as compared to previous years. While this has had an adverse effect on the Company's SAIDI and SAIFI scores as defined and calculated in accordance with the LPSC's 1998 General Order, it improves the overall reliability of the system from the customer's perspective. Another contributor to ELL's recent SAIDI scores is the implementation of enhanced safe work practices applicable to the Company's linemen and distribution workers. Specifically, the Company's updated safety practices are designed to further reduce the risk of electrical contact and arc flash injuries when performing work on

[6] *See* LPSC General Order (4/30/98) at §2 ("**Major Event:** A catastrophic event that exceeds the design limits of the electric power system, such as an extreme storm. These events shall include situations where there is a loss of service to 10% or more of the customers in a region, and where full restoration of all affected customers requires more than 24 hours from the beginning of the event.").

or near energized primary wires by requiring de-energization of all or portions of a work area for enhanced safety. This process requires increased coordination of switching orders and additional communication between the crew and leadership. These safety measures will also help the Company adapt and keep workers safe given the presence of DERs that interact with ELL's distribution system. Although these updated safety practices will be instrumental in helping ELL maintain a safe work environment for its employees and contractors, the protocols could contribute to increased outage frequency and/or duration as experienced in 2018 and 2019.

In short, as the industry evolves and adopts new approaches to managing distribution assets and maintaining safe worksites, SAIFI and SAIDI indices should not be viewed in isolation from those developments, which can impact the scores. As Company witness Mr. Phillip R. May notes in his testimony, the holistic approach of grid modernization does challenge the way we have traditionally viewed and evaluated the distribution system, but the overall effort and investment will improve reliability and help ELL meet customer expectations. And, as I discuss further below, ELL has developed a distribution plan that leverages longstanding reliability programs and new technologies to build a modern, reliable, and resilient distribution system.

B. Overview of ELL's Distribution Operations Organization

Q15. PLEASE DESCRIBE ELL'S DISTRIBUTION OPERATIONS ORGANIZATION.

A. ELL's Distribution Operations Organization operates, designs, constructs, and maintains the electric distribution system that provides power and energy to homes, offices, businesses, and governmental entities in ELL's service area. The Distribution Operations

Organization consists of two ongoing core business functions: (i) engineering and (ii) operations, maintenance, and construction. The Distribution Operations Organization utilizes the work of over 900 employees, including engineers; engineering associates; construction and maintenance mechanics; operators; region, line, and construction supervisors; drafters; storekeepers; administrative assistants; and various others, as well as nearly 400 contract resources. These employees and contractors provide support for ELL in the areas of engineering, design, operations, accounting, customer service, and other miscellaneous areas.

Q16. WHAT ACTIVITIES ARE INCLUDED WITHIN THE FIRST OF THESE CORE BUSINESS AREAS, THE ENGINEERING AREA?

A. The engineering group designs projects to serve new customers, replace aging infrastructure, improve reliability, and serve area load growth. The work groups use ELL's design and construction standards, which comply with all National Electric Safety Code ("NESC") standards and are in accordance with other recognized industry standards.

Q17. PLEASE DESCRIBE THE ACTIVITIES WITHIN THE SECOND OF THESE AREAS, OPERATIONS, MAINTENANCE, AND CONSTRUCTION.

A. The electric distribution system consists of an electric grid that supplies electric energy and power to ELL's customers. The operations group monitors the distribution system load and voltage levels to ensure there is adequate capacity to meet customer needs. In addition, the operations area handles routine and emergency routing of personnel to maintain a

reliable supply of electricity to customers and to address customer interruptions as quickly as reasonably possible when they do occur.

Because the electric distribution system ages over time, as does all infrastructure, it requires continuous upkeep to preserve its integrity and its ability to provide reliable service to customers. These maintenance activities are both proactive and reactive, as discussed later in my testimony. Proactive maintenance includes equipment inspections and introducing new maintenance practices to enhance the overall operation and reliability of the distribution system, whereas reactive repairs and upkeep are required when service is interrupted due to strong winds, lightning, or other types of damage.

Finally, in order to accommodate new customers, ELL must add facilities to serve them. These additions, both major and minor, require constructing distribution line extensions or increasing the capacity of existing facilities. The construction of new or enhanced distribution lines is part of ELL's goal to provide safe and reliable service at the lowest reasonable cost, and on a non-discriminatory basis, to all current and prospective customers.

Q18. ARE THERE SPECIFIC GOALS IN THE AREA OF OPERATIONS, MAINTENANCE, AND CONSTRUCTION FOR PROVIDING QUALITY SERVICE TO ELL'S CUSTOMERS?

A. Yes. ELL's Distribution Operations Organization strives to: (1) minimize the frequency of customer interruptions; (2) restore service as quickly as reasonably possible following interruptions in customers' service; and (3) meet construction and service delivery commitments to customers. Goals (1) and (2) regarding outage frequency and duration are

the two main components of the broader goal that the utility industry refers to as "reliability." In addition to these three operational components, the Company's communications with customers through call centers, outage or other notifications and updates, and direct contact are also vital service quality components.

Q19. FROM YOUR PERSPECTIVE, WHAT ARE THE MOST SIGNIFICANT CHALLENGES THAT ELL FACES IN MEETING THE RELIABILITY GOALS THAT YOU JUST DISCUSSED?

A. In addition to the customer interruption causes that I noted above (OROW vegetation, vehicle incidents, primary conductor equipment failure, and lightning), the most significant challenges to maintaining reliable service include safely replacing or upgrading ELL's aging distribution infrastructure; maintaining safe work practices; efficiently addressing vegetation management; developing design and planning guidelines that improve system resiliency; keeping pace with the evolving needs and expectations of our customers; capitalizing on emerging grid technologies to deliver sustainable results; and restoring the distribution system after hurricanes and other major weather events.

Q20. HOW IS ELL ADDRESSING THOSE CHALLENGES?

A. As I describe in Section IV of my testimony, ELL has ramped up the pace and level of its distribution investment in recent years in response to the challenges I mentioned above and plans to continue making significant investments to modernize and improve the reliability and resiliency of the distribution grid. When selecting and prioritizing distribution capital projects, the Company considers multiple factors, including the number of customers

affected, potential project execution risks, expected reliability benefits, and project costs. With respect to efficiently addressing vegetation management, I discuss in Section V of my testimony ELL's proposal to systematically address OROW vegetation removal activities in conjunction with other major infrastructure upgrades in order to drive cost-savings and efficiencies. This proposal is consistent with ELL's goals to provide safe and reliable service at the lowest reasonable cost, and to further enhance service quality by reducing customer interruptions.

C. Efforts to Enhance ELL's Quality of Service & Distribution Infrastructure

Q21. PLEASE IDENTIFY THE TYPES OF INVESTMENTS THAT ELL IS MAKING THROUGH ITS GRID MODERNIZATION EFFORTS.

A. Grid modernization involves investing in and incorporating equipment and tools, as well as specialized sensors and software, which perform more advanced technological functions than the Company's traditional distribution infrastructure. The technological advancements afforded by grid modernization investments are expected to provide additional signals, information, and insights that will facilitate improved reliability performance. Many of these kinds of equipment build on and utilize the capabilities presently being enabled through AMS deployment and its associated support systems by collecting, analyzing, and delivering information from the field necessary for grid automation, real-time decision making, and long-term planning. The technology and infrastructure components that comprise a modernized grid can be thought of in three broad categories: Smart Grid Infrastructure, Smart Grid Technology, and Advanced Distribution Planning.

The first category, Smart Grid Infrastructure, includes assets capable of supporting increased bi-directional power flow and which facilitate optimization of DERs like solar power photovoltaic and battery storage systems. Examples of Smart Grid Infrastructure assets include conductors with increased load and carrying capacity, electronic reclosers to sense and isolate issues, and smart tie switches allowing alternate energy paths.

The second category, Smart Grid Technology, represents the specialized sensors, collectors, and associated software systems that collect, analyze, and deliver information for real-time decision making and automation. Examples of technologies in this category include: (i) Smart Grid Sensors: small communication nodes that serve as detection stations in a sensor network, which enable the remote monitoring of equipment such as transformers and power lines; (ii) DA Enabled Devices: distribution grid devices, such as reclosers, regulators, and capacitors, that are equipped with smart controls that enable the devices to communicate with utility software solutions and perform real-time sensing and reconfiguration of the distribution system; and (iii) Data Analytics Software: computer programs that use data from smart devices to identify portions of the distribution system reporting abnormal conditions and enable proactive engineering analyses to prevent outages in these areas by replacing equipment before it fails. The DA-enabled devices, together with the Outage Management System and Distribution Management System[7] presently being deployed by ELL in conjunction with the AMS project, will be utilized to

[7] Outage Management System and Distribution Management System is a software system that integrates real-time networked field devices and advanced metering infrastructure data with a geospatial information system. This system provides more efficient and intelligent energy grid operations and improves situational awareness for operators. Networked field devices include: automated feeder switches, reclosers, capacitors, and voltage regulators. This technology can manage and shift load, identify faults, and improve response time, thereby shortening the overall duration of outages.

enable Self-Healing Networks, which monitor the distribution system for any outage conditions and automatically reconfigure the path of power to isolate the outage and restore power to all unaffected customers in the surrounding area. Additionally, these investments reduce power line losses with active management of voltage and reactive power, resulting in opportunities to reduce fuel costs for customers.

The third category, Advanced Distribution Planning, represents a change in how the distribution system is evaluated and modifications are designed, as enabled by increased data and new analytics from new technologies. Currently, distribution planning is studied at system peak periods, and this practice traditionally has been effective for maintaining ELL's distribution system. However, ELL is transitioning from peak based analysis to Advanced Distribution Planning, which will leverage additional data captured from AMS and DA to perform more robust analysis during multiple time periods and under differing load conditions to ensure infrastructure upgrade projects meet future load scenarios.

Q22. PLEASE ELABORATE ON GRID MODERNIZATION'S EFFECT ON DISTRIBUTION SYSTEM PLANNING.

A. Traditional planning involves modeling the distribution system and developing capital projects to address area load growth based on summer and winter peaks, which are discrete moments in time. In contrast, with the deployment of AMS, planners will have real-time load data at much more frequent intervals, which will allow them to develop a feeder and/or area load profile and better predict future capital improvement needs. Moreover, as the number of DERs increase on the distribution system, the load flows, voltage, and even the

load profile of individual feeders will change drastically. The new and nearly real-time data will be necessary to maintain, manage, and plan for the distribution system.

Q23. WOULD MODERNIZATION OF ELL'S DISTRIBUTION SYSTEM ELIMINATE THE NEED FOR ONGOING MAINTENANCE OF THAT SYSTEM?

A. No. Even with modernization of ELL's distribution system, ELL will still need to invest time, effort, and capital to maintain the modernized distribution system. But the grid modernization investments will enable ELL's Distribution Operations Organization with data points to greatly improve the way it performs these functions. ELL's distribution plan, therefore, combines grid modernization efforts with traditional reliability and infrastructure programs with an objective to plan and implement these projects at a reasonable cost to customers.

Q24. PLEASE IDENTIFY THE COMPANY'S TRADITIONAL RELIABILITY AND INFRASTRUCTURE IMPROVEMENT PROGRAMS.

A. ELL currently implements several programs to improve reliability and maintain infrastructure. Some of these include the FOCUS Program, Sectionalizing/DA, the Backbone Program, the Pole Program, Equipment Inspection and Maintenance, Underground Residential Distribution ("URD")/Cable Programs, and Vegetation Management. As I explain later, the majority of ELL's distribution plan discussed in Section IV is comprised of distribution line reliability projects that are accomplished through these reliability and infrastructure programs. Many of these efforts are reactive, meaning that the actions taken are in response to devices that have failed and/or outages

that have occurred, while others are proactive, meaning that the actions taken are an attempt to prevent devices from failing and/or outages from occurring. Thus, while some of the specific remedies and mitigation measures may be similar among the programs, the process for identifying issues is different.

Q25. PLEASE DESCRIBE THE FOCUS PROGRAM.

A. The FOCUS Program is a reactive program that uses historical outage data over the prior two-year period and an algorithm to identify devices (*e.g.*, breakers, reclosers, line fuses, and sectionalizers) where reliability has been adversely affected. The FOCUS Program then creates a list of FOCUS devices, which is prioritized by customer interruptions and reviewed and updated on a quarterly basis. Using local knowledge and the algorithm rank, areas behind the devices are then selected to have work performed during the calendar year. The intent of the FOCUS Program is to improve the reliability performance of the selected FOCUS-identified devices.

The FOCUS Program addresses the reliability needs of each device through a Reliability Inspection process (*i.e.*, point by point) to identify repairs and improvements that have the potential of improving a line segment's performance and developing a remediation plan, which may include the following:

- installation of animal guards and/or protective covers to mitigate outages caused by animals;
- replacement of cross-arms, insulators, conductors, arresters, switches, and other equipment;
- vegetation mitigation impacting the segment performance;

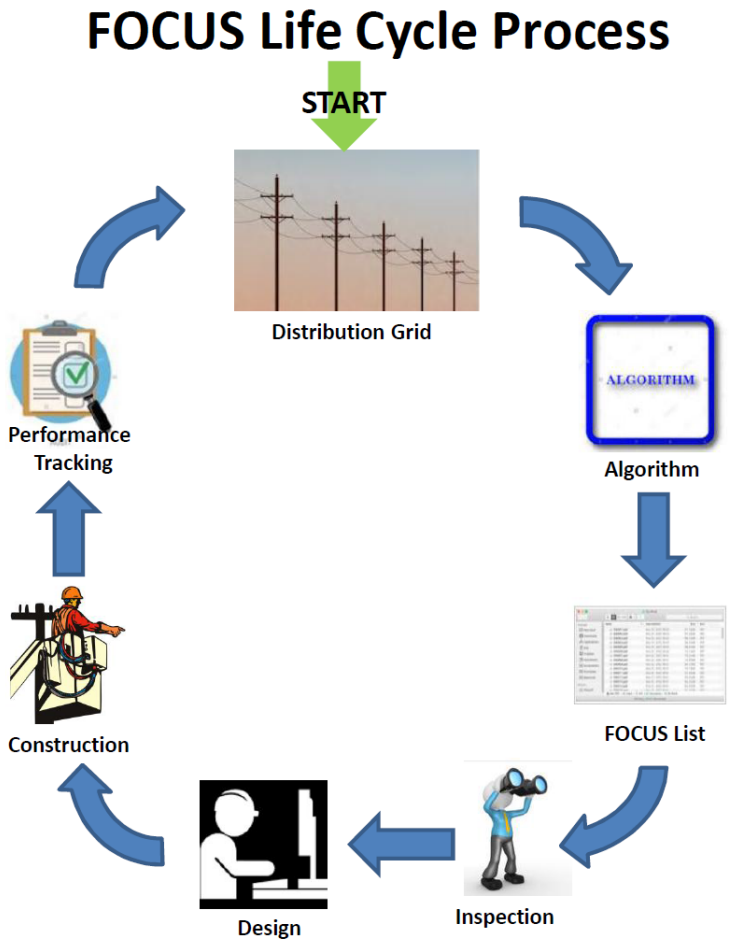
- shielding, installation, or relocation of lightning arresters, removing grounds from metal brackets in the primary zone, and/or the installation of Hendrix ground wire and ground rods to improve system Base Insulation Level ("BIL"); and
- review of protective device coordination.

The following pictures illustrate a few of the components that are inspected in the FOCUS Program, from left to right: (1) lightning arrester; (2) cross-arm (including primary wires, secondary wires, a disconnect switch, and insulators); and (3) insulator close-up.



Figure 2 illustrates the overall FOCUS process.

Figure 2



Q26. PLEASE DESCRIBE THE SECTIONALIZING PROGRAM AND DISTRIBUTION AUTOMATION EFFORTS.

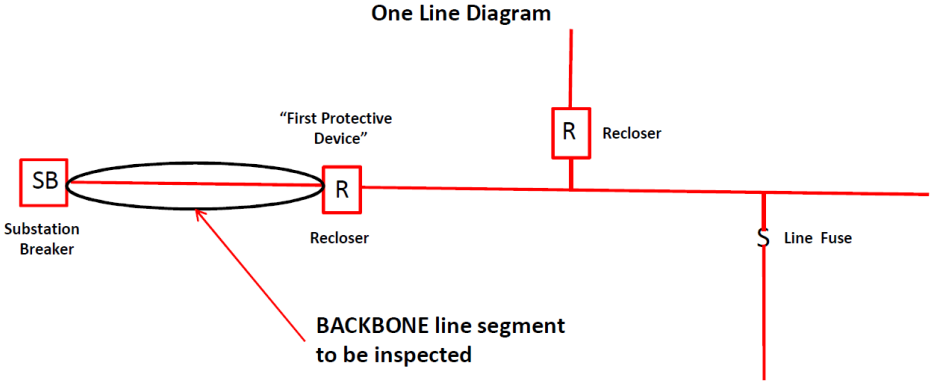
A. The annual sectionalizing and Distribution Automation programs are designed to identify opportunities to reduce customer exposure and customer outage minutes through the addition of automatic isolating devices (*i.e.*, an automated load transfer scheme ("ALT")) and upgrading existing sectionalizing locations to prepare for future ALTs. An ALT is a

group of multiple reclosers that communicate with each other to minimize the outage to as small of an area as possible, thus quickly restoring service to as many customers as possible. Proposals are planned, prioritized, and implemented based on their projected impact on reliability.

Q27. PLEASE DESCRIBE THE BACKBONE PROGRAM.

A. The Backbone Program is a proactive (*i.e.*, not based on historical outages) infrastructure program designed to inspect and address the portion of selected circuits that have the largest potential for customer impact, which is the portion of the line from the substation breaker up to and including the first protective device that has the responsibility of isolating the remainder of the circuit. If the first protective device falls within the first 15 spans of the circuit, inspection would continue past that point to the next protective device or to the end of the feeder, whichever is first. The intent of the Backbone Program is to proactively identify potential problems before they result in an outage. Figure 3 illustrates the line segment inspected in the Backbone Program.

Figure 3
One Line Diagram



The Backbone Program addresses the identified potential reliability problems through the Reliability Inspection process (*i.e.*, point by point) described above for the FOCUS Program. The difference between the two programs is that FOCUS devices are identified because of outages, whereas Backbone devices are identified proactively to prevent outages.

Q28. PLEASE DESCRIBE THE POLE PROGRAM.

A. The Pole Program is a cyclical proactive inspection and preventive maintenance program. The Pole Program consists of a visual inspection of the pole and, where appropriate, excavation or reinforcement. The recommended actions depend on the findings of the inspection. Poles judged to be sound receive no further action. Those identified as needing additional attention are either treated in the field or reinforced, depending on the condition of the pole. Those that are deemed beyond treatment or reinforcement are prioritized for replacement. The following pictures illustrate excavating and treating a pole:

Q29. PLEASE DESCRIBE THE EQUIPMENT INSPECTION AND MAINTENANCE PROGRAM.

A. This program includes recloser, capacitor bank, and voltage regulator inspections. Issues are either immediately resolved in the field or reported for planning and implementation of repair or replacement.

Q30. PLEASE DESCRIBE THE URD/CABLE PROGRAM.

A. This program involves the splicing or replacement of failed primary URD cable. Replacement of failed URD cable is performed in lieu of splicing when possible to prevent future outages.

Q31. PLEASE DESCRIBE THE VEGETATION MANAGEMENT PROGRAM.

A. ELL's distribution line vegetation management program consists primarily of a cycle-based proactive element, but it also includes a reactive, customer-driven component and a

selective herbicide program. The proactive trim cycles are examined annually and are determined by several factors, including growth rates, type and density of side and floor vegetation, vegetation-related outage information, and time since last maintenance. Identified circuits or areas are maintained using a combination of both conventional side trimming and herbicides depending on the specific application. The reactive component of the program consists of investigating potential problem areas that are identified by Company personnel and/or stakeholders and determining a remedial course of action when the potential problem involves the Company's facilities. The remedial work itself, such as the removal of danger trees that I discuss below in Section V, can be considered proactive because it may avoid future damage to the distribution system (and the associated cost of repair).

Q32. HOW WILL GRID MODERNIZATION AND ONGOING MAINTENANCE AND RELIABILITY WORK BE COORDINATED AND EXECUTED?

A. A dedicated Utility Grid Modernization and Strategy group supports ELL's and the other Entergy Operating Companies' distribution grid modernization efforts and other long-term distribution grid infrastructure projects. The focus of this organization is to create a strong, integrated energy grid that provides customers safe, reliable, and affordable products and services, like integration of DERs. This group oversees the grid modernization projects, including AMS deployment, enterprise asset management, and DA functionality. That group coordinates with ELL's Distribution Operations Organization, which will remain responsible for the ongoing, routine maintenance and reliability projects I discussed earlier. This structure provides resources dedicated to both maintaining the distribution grid and

responding to outages, as they do today, with a set of dedicated resources focused on the strategic long-term planning and modernization of the distribution grid, enabling the Company to better meet customers' expectations for safe, reliable service. Evolving technology and innovations allow the Company to evaluate the prioritization of work to ensure ELL continues to provide energy at the lowest reasonable cost.

IV. DISTRIBUTION CAPITAL ADDITIONS

Q33. WHAT IS THE PURPOSE OF THIS SECTION OF YOUR TESTIMONY?

A. I previously discussed some of ELL's most notable challenges with respect to improving its reliability performance and reducing distribution-related customer interruptions. As I also mentioned, ELL like the electric utility industry in general, is in a cycle of increased capital expenditures to replace or upgrade aging distribution infrastructure to improve reliability and keep pace with, among other things, evolving technology and expanding regulatory and safety requirements. This section of my testimony discusses the types of distribution capital investments ELL has made in recent years and plans to make in the near-term to address these identified challenges.

Q34. WHAT IS THE TIME PERIOD FOR THE DISTRIBUTION CAPITAL ADDITIONS PRESENTED IN THIS SECTION OF YOUR TESTIMONY?

A. The total timeframe I present here spans the ten-year period from 2013 – 2023. The historical investment levels are provided for context to illustrate the magnitude of the upward trend in investment levels. This period includes distribution costs that have already been reflected in ELL's retail rates or will be recoverable in ELL's existing FRP. The

forecasted investments in years 2020 – 2023 reflect the period for which the Company would seek to recover its distribution investment through the DRM, should the mechanism be approved as part of ELL's requested FRP extension.

Q35. PLEASE DESCRIBE THE PROCESS ELL UTILIZES TO UNDERTAKE DISTRIBUTION CAPITAL EXPENDITURES.

A. The engineering group in the Distribution Operations Organization identifies new capital projects based on information from its reliability and infrastructure improvement programs, customer requests, system growth requirements, System Improvements, (which I discuss further below) new customers, system-wide applications, and upgrades. ELL evaluates, designs, and prioritizes the projects utilizing parameters that balance the costs of a project against the benefits it provides to customers. Most of these capital projects are assigned to ELL/ ESL personnel or contractors for construction. ELL selects contractors by evaluated bids, which include safety, quality of work, performance, storm response, and costs. Both during construction and upon completion, ELL/ESL personnel audit the jobs for quality assurance and accuracy of invoice processing.

Q36. WHAT ARE THE LEVELS OF ACTUAL AND EXPECTED DISTRIBUTION LINE CAPITAL INVESTMENT FOR THE 2013-2023 PERIOD?

A. The total dollar amount of Distribution Line and distribution-related General Plant additions closed to plant from January 1, 2013, through December 31, 2019 was $1.3 billion, and the projected dollar amount of these capital additions for 2020 – 2023 is [redacted]. The average annual distribution capital investment for the projected period is

nearly [redacted] the average annual investment during the historic period. The major drivers of the investment levels can be broken down into the following categories of costs: (1) Distribution Line Reliability, (2) Load Additions, (3) Substation Reliability, and (4) Lighting - Other. Figure 4 summarizes the annual costs in each of these categories.

Figure 4
ELL Distribution Line Dollars
Closed to Plant in Service
January 1, 2013 – December 31, 2023
(Highly Sensitive Protected Materials)

Distribution Closing to Plant ($M)	2013	2014	2015	2016	2017	2018	2019	[redacted]
Distribution Line Reliability	47	48	60	75	70	98	143	
Load Additions	55	65	58	70	56	65	75	
Substation Reliability	9	15	26	43	27	34	47	
Lighting - Other	14	15	12	24	24	25	21	
Total	**124**	**143**	**156**	**213**	**177**	**222**	**286**	

*Note: These totals exclude amounts related to storm damage and AMS investments.

Figure 4 demonstrates that ELL's historical baseline Distribution Line investment levels have increased significantly in recent years, with annual Distribution Line plant closings increasing from $124 million in 2013 to $286 million in 2019. By 2023, annual plant closings are expected to reach [redacted]. Most of the costs fall under the Distribution Line Reliability category, which includes the routine reliability and infrastructure programs and grid modernization efforts I discuss in Section III. The Distribution Line Reliability category represents approximately 33.6% of the total historic spend and roughly [redacted] of the projected spend for 2020 – 2023. As such, this section of

my testimony largely focuses on the Distribution Line Reliability category given its relative effect on ELL's overall distribution spend. The other buckets of costs (Load Additions, Substation Reliability, and Lighting – Other) are relatively flat after 2020. However, the upward trend in aggregate distribution infrastructure investment levels is expected to continue for the years 2020 – 2023. Indeed, while ELL's distribution plan involved an average annual investment of $193 million for the historical period, the Company expects an average annual investment of [redacted] for the forecasted period. This average distribution capital investment for the forecasted period is nearly [redacted] the average investment over the historical period.

Q37. PLEASE DEFINE EACH OF THE BUCKETS DEPICTED IN FIGURE 4.

A. These buckets of costs are described as follows:

- **Distribution Line Reliability**: This category primarily includes the routine reliability and infrastructure programs (such as the FOCUS Program, Sectionalizing/DA, the Backbone Program, the Pole Program, Equipment Inspection and Maintenance, and URD/Cable Projects) and grid modernization efforts discussed in Section III of my testimony. This category includes projects to replace critical equipment that has failed and must be replaced on an emergency basis, as well as activities performed as a result of customer interruptions. It also includes what we refer to as "System Improvements," which are projects that maintain the integrity and reliability of the overall distribution system, for example: projects to plan for load growth, to plan for contingencies, to maximize circuit availability, and to minimize the number of customer interruptions.

- **Load Additions**: ELL undertakes Load Addition or "Revenue" projects to connect new customers to the system or to serve load additions for existing customers. The obligation to serve drives these projects. This category also includes projects for which the Company receives facility charges and projects to install/remove metering.
- **Substation Reliability**: This category captures investments at substations, which are the points of transition from the transmission grid to the distribution system. These investments primarily include power transformers, switches, bus work, main and feeder breakers, and associated components needed to transform the power to a level suitable for distribution.
- **Lighting - Other**: This category largely consists of (1) street and private area lighting projects and (2) certain technological investments that enable ELL to be more effective in response to customer demands and operational needs.

Although these four buckets include different types of projects, they all collectively dovetail with the objectives I describe in Section III of my testimony in that they facilitate ELL's objective to sustain or improve its service quality and modernize its grid.

Q38. PLEASE DISCUSS THE TRENDS YOU OBSERVED FOR INVESTMENTS IN THE LOAD ADDITION CATEGORY.

A. Of the four buckets of costs presented in this section of my testimony, the Load Additions category reflects the second highest source of ELL's distribution capital investment. Figure 4 depicts that the level of investment in this category has grown over the past few years. This is due to the number of new locations and subdivisions being served by ELL, as well as the distribution system's limited capacity for growth. For example, there has

been an increase in the number of multi-lot subdivision developments in rural portions of ELL's service area, where distribution facilities previously served only a few farm homes. In some cases, the smaller conductors that previously provided power must be replaced to ensure capacity to serve the homes in the new development. Installing larger conductors, in turn, requires that the existing poles be replaced with taller and stronger poles to meet NESC requirements. Projects like these are becoming more frequent, as reflected in the spending estimates in this category for test year 2020.

Q39. WHAT TRENDS HAVE YOU OBSERVED REGARDING INVESTMENTS IN THE SUBSTATION RELIABILITY CATEGORY?

A. Figure 4 shows that while investment levels in this category have increased over time, there are not many significant fluctuations in the estimated costs year-over-year in the forecasted period.

Q40. WHAT TRENDS HAVE YOU OBSERVED WITH RESPECT TO INVESTMENTS IN THE LIGHTING - OTHER CATEGORY?

A. Figure 4 shows slight increases in annual investment levels in this category, but those investments are expected to be flatten to a lower level in the out years.

Q41. FINALLY, PLEASE ELABORATE ON THE TRENDS OBSERVED IN THE DISTRIBUTION LINE RELIABILITY CATEGORY.

A. This category reflects the largest source of ELL's distribution investitures for the ten-year period I sponsor in my testimony. As indicated on Figure 5, the aggregate addition to plant

in service for Distribution Line Reliability projects from 2013 – 2019 was $445 million. The aggregate investment level for the projected period of 2020 – 2023 is expected to be [redacted], more than [redacted] the investment levels in the historic period.

Figure 5
ELL Distribution Line Reliability Dollars
Closed to Plant in Service
January 1, 2013 – December 31, 2023
(Highly Sensitive Protected Materials)

Distribution Closing to Plant ($M)	2013	2014	2015	2016	2017	2018	2019	[redacted]
Distribution Line Reliability	47	48	60	75	70	98	143	

*Note: These totals exclude amounts related to storm damage and AMS investments.

As Figure 5 above indicates, this category of costs reflects the crux of ELL's distribution plan to improve its distribution system.

Q42. CAN YOU PROVIDE ANY EXAMPLES OF THE TYPE OF PROJECTS THAT ELL HAS UNDERTAKEN TO IMPROVE ITS DISTRIBUTION SYSTEM?

A. Certainly. As I mentioned earlier in my testimony, ELL's distribution system developed over time, and some areas of the system have grown rapidly since the installation of our facilities to provide electric service to those communities. After newly developed areas mature and the pace of growth slows, reliability problems can emerge as the distribution system ages. In analyzing those problems, we may discover opportunities to re-configure circuits utilizing new technological advances in ways that could not have been foreseen when those circuits were first constructed.

A helpful example of the type of project that ELL is undertaking to modernize its distribution system is the recent experience in the University City neighborhood in the City of Kenner. Between 1950 and 1990, Kenner grew from a small town of around 5,500 residents to a suburban city of more than 72,000 residents.[8] The University City neighborhood was part of that growth. At the request of the developers who were building out this area, many circuits in that neighborhood were constructed along rear lot lines. Consistent with industry experience in other areas, it became challenging over time to inspect and maintain poles and other equipment located in customers' back yards largely due to access issues, ranging from the construction of fences and other structures in our right of way to challenges associated with vegetation that interferes with our equipment. As time passed, this neighborhood also noticed the effects of soil subsidence that resulted in increased tension being placed on some of our substation equipment and other underground equipment in this area, which contributed to increased equipment damage and a decline in reliability that resulted in more frequent customer outages. Approximately 15,500 customers in the University City neighborhood are served by ELL's University City Substation. In 2016, there were over 31,000 customer interruptions on the feeders that serve this area.

To help improve reliability in this area, ELL analyzed the various outage causes and developed a plan to replace certain equipment and install automated technologies that were largely unavailable in previous years. Ultimately, ELL invested over $1 million between 2016 and 2018 in an effort to help improve the reliability of the University City

[8] Kenner's population began to decline in the 1990s, and its population was 66,702 in the 2010 U.S. Census.

Substation feeders, with the bulk of the investment occurring in 2018. The Company replaced over 100 poles and over 200 associated components such as crossarms, brackets, fuse switches, and lightning arrestors. ELL also implemented more modern automated technologies to proactively minimize the number of customers impacted during outage events. These automated technologies included the installation of multiple automatic reclosers and ALT configurations. The automatic reclosers automatically isolate faulted sections of the electrical distribution system in order to significantly reduce the number of customers potentially exposed to an outage event. The ALTs are designed to automatically transfer certain groups of customers from one source of power to another during an outage event, preventing those customers from experiencing a sustained outage from the loss of a single source outside of the protected area. I attach as Exhibit APA-2 a map of the University City feeder backbone that shows where the automatic reclosers and ALTs were installed.

These efforts have significantly improved reliability for our customers in the University City neighborhood. In 2019, total customer interruptions on the feeders that serve our customers in the University City neighborhood dropped to 11,144, a 64% improvement over 2016. Likewise, SAIFI for customers served from the University City substation improved from an average of 0.13 to 0.064 outages per customer when comparing 2016 to 2019 performance. Furthermore, the average duration, SAIDI, dropped from 10.4 minutes per outage to 4.7 minutes, an improvement of approximately 55%. The plan implemented in the University City neighborhood in Kenner is a prime example of the benefits that will be realized by customers as we continue to identify opportunities in our work to modernize ELL's distribution grid.

Q43. ARE THERE OTHER HELPFUL EXAMPLES OF THESE TYPES OF INVESTMENTS?

A. Yes, there are. Another example is the construction of the new Cadeville Substation in 2018. The need for this new substation was driven by continued load growth in Southwest Ouachita Parish, which, over time, resulted in low voltage issues and suboptimal reliability performance in the West Monroe area. To address this, ELL constructed 14 miles of radial transmission line to replace the conductor that was overloading at times and causing low voltage; constructed a new substation at ELL's Cadeville site and replaced line equipment in order to meet the load requirements in the area; and installed power transformers needed to transform the power to a level suitable for distribution to the area. In addition to addressing the voltage concern, this project included the installation of three ALTs, providing over 2,200 customers with an alternate source of power should their normal source experience an outage outside of the protected area. These efforts have significantly improved reliability for customers in Southwest Ouachita Parish. In 2019, total customer interruptions and outage counts on both feeders that serve that area dropped significantly. Customer interruptions dropped from 2,358 to 1,383 on one of the feeders that served this area as compared to 2015, and from 5,246 to 689 on the other affected feeder. Outages on these feeders dropped from 142 to 93 on one of the affected feeders and from 132 to 27 on the other when comparing 2015 and 2019 results. Overall, SAIFI and SAIDI for customers served from the Cadeville substation improved significantly.

The Alaska substation improvement project in downtown Baton Rouge is another helpful example. Here, a loss of a transmission source or an equipment failure at ELL's existing Beauregard substation could result in an outage to the entire downtown Baton

Rouge network grid, approximately 19 MW. The projected load growth in the area between Louisiana State University and downtown Baton Rouge over the next 5 years, including an additional 10 MW at the Water Campus, further exacerbated the number of customers that could be affected by a potential disturbance. To resolve this, ELL installed a third power transformer and two new feeder breakers at Alaska substation. This solution, which was completed in 2018, allowed ELL to automatically isolate and re-energize undamaged sections of a feeder after a disturbance using an alternative power source to ultimately minimize the impact of an outage by decreasing the number of affected customers.

Q44. PLEASE SUMMARIZE THE PRIMARY COMPONENTS OF ELL'S DISTRIBUTION PLAN FOR 2020 THROUGH 2023.

A. The prospective portion of ELL's distribution plan will remain focused on delivering improved reliability of electric service to its customers by continuing to invest in the traditional reliability and infrastructure programs I discuss in Section III (such as the FOCUS Program, Sectionalizing/DA, the Backbone Program, the Pole Program, Equipment Inspection and Maintenance, and URD/Cable Projects), while leveraging technology and incorporating more holistic solutions to establish a modern, resilient distribution system. By undertaking more projects such as the examples described above in the University City, South Ouachita Parish, and Downtown Baton Rouge areas, ELL will continue to improve customer satisfaction. As depicted in Figure 6 below, the investment levels from 2020 – 2023 are significant and reflect higher infrastructure investments than in the historic period presented in Figure 4 above.

Figure 6[9]:
Projected Distribution Projects Closed-to-Plant-In-Service Costs ($M) By Year
(Highly Sensitive Protected Materials)

Year	Estimated Amount ($M)
2020	[redacted]
2021	
2022	
2023	
Total	

Additional detail about the specific investments expected to close to plant in the 2020 – 2023 timeframe are reflected in my Exhibit APA-1, but, as I've stated, the most substantial area of investment is in ELL's reliability infrastructure and grid modernization programs. As discussed above, the Distribution Line Reliability category reflects approximately [redacted] of ELL's aggregate forward-looking distribution plan for 2020 – 2023. These investments will include improvement projects in areas like the Northshore, where ELL is developing and implementing plans for significant investments to improve resilience and reliability in Tangipahoa Parish, and in the Southeast region, where networks that serve the Westbank and Bayou areas consist of many overwater and rear alley distribution lines that make restoration difficult and time consuming. In addition, ELL is currently designing an upgrade to reconductor and provide a more robust source of power to customers south of Erath. These are only a few examples of prospective efforts that ELL is making or exploring as part of its distribution plan. These projects, much like those discussed earlier, include solutions such as sectionalizing to minimize customer impact during an outage, installation of new substations to provide additional power sources to

[9] Some of the spending estimates are preliminary and likely to change as detailed scoping on the various distribution projects progresses.

serve increasing load, and evaluation of line relocations (either underground or to more accessible routes), making the system more reliable and resilient.

Q45. DOES EXHIBIT APA-1 REPRESENT ALL OF ELL'S EXPECTED DISTRIBUTION PLANT CLOSINGS THROUGH 2023?

A. Yes. The estimates reflected in Exhibit APA-1 reflect ELL's expected near-term distribution investment based on currently known facts and circumstances. Of course, new or different circumstances could cause projects to be added and others to be modified or even removed if no longer cost effective. In addition, actual timing can and likely will differ from that estimated. I also note that my Exhibit APA-1 is more comprehensive than the figures presented in this section of my testimony in that it includes storm costs and costs related to AMS infrastructure. Those costs were excluded from the figures in my testimony in order to isolate the sources of increased capital investment for ELL's distribution plan. The unpredictability of annual storm costs would provide for a skewed annual comparison. With respect to AMS costs, those costs were excluded in recognition that the Commission has authorized recovery of those costs through a separate recovery mechanism.[10]

[10] LPSC Order No. U-34320 *In Re: Application of Entergy Louisiana, LLC for Approval to Implement a Permanent Advanced Metering System and Request for Cost Recovery and Related Relief*, dated August 25, 2017.

Q46. DO THE SPENDING LEVELS REFLECTED IN EXHIBIT APA-1 ENABLE ELL TO PROVIDE RELIABLE SERVICE TO ITS CUSTOMERS AT THE LOWEST REASONABLE COST?

A. Yes. Although the distribution plan reflects a significant increase in distribution investment levels, it was developed carefully based on a systematic prioritization of distribution investments that are focused on reducing customer interruptions and improving system resilience at the lowest reasonable cost to customers. As I stated earlier, the Company considers multiple factors when selecting and prioritizing distribution capital projects for its distribution plan. Over time, the investments reflected in ELL's distribution plan are expected to result in a shift from investments for reactive work based on equipment failure and customer interruptions to an increase in investment for preventative and planned projects expected to deliver long term sustainable system reliability. This balanced approach will provide both short-term and long-term reliability improvements while addressing distribution system requirements to meet customer expectations for resiliency and the ability to employ new technologies in the way that energy is produced and delivered.

Q47. PLEASE ELABORATE ON HOW THE COMPANY'S FORECASTED CAPITAL ADDITIONS FOR 2020 THROUGH 2023 ARE EXPECTED TO IMPROVE SERVICE FOR CUSTOMERS.

A. The level of investment reflected in the distribution plan is necessary and reasonable to support distribution capital projects, mandatory reliability requirements, and capital maintenance programs that, in turn, will allow ELL to continue providing reliable service

to its customers. These investments address replacing aging infrastructure, targeting solutions to improve reliability in the short term while planning for longer term sustainable reliability, and putting processes in place to ensure ELL's portfolio is executed in a comprehensive manner to better ensure the delivery of benefits to customers. These benefits include (i) enhanced reliability for customers due to technological upgrades designed to minimize the frequency, effects, and duration of service interruptions to customers; (ii) increased system visibility and awareness that enable faster response times during service interruptions; (iii) enablement of a more proactive and efficient approach to reliability planning and system maintenance through predictive analytics; and (iv) increased customer centricity and expanded access to the benefits of technological advancements. As Mr. Thomas explains more fully, the Commission would have an opportunity to review all plant closings connected to ELL's annual distribution investments during the applicable FRP filing year.

V. OUTSIDE OF RIGHT-OF-WAY VEGETATION REMOVAL

Q48. PLEASE DESCRIBE THE OROW PROGRAM THAT THE COMPANY IS PROPOSING.

A. ELL is proposing, over a three-year period (2020-2022), to spend [redacted] annually to remove damaged, dying, diseased, decayed, leaning, or otherwise compromised trees located outside its OROWs that that might endanger the Company's conductors and structures, particularly during storm events. Vegetation management programs for the Company's transmission and distribution systems seek to address such danger trees, which are often identified by ELL's employees, contractors, customers, and other stakeholders.

Those efforts, which require negotiations with OROW property owners, are largely reactive and differ from the Company's proactive cycle-based trimming and treatment programs for OROW maintenance. The increased investment that ELL is making in its distribution system over the next three years will provide additional opportunities to identify and address danger trees as more work is done on the grid.

Q49. IS OROW VEGETATION A SIGNIFICANT CAUSE OF OUTAGES?

A. Yes. In 2018, the Company saw an increase in vegetation-related customer interruptions and customer minutes interrupted over prior years. Although those interruptions decreased in frequency and duration in 2019, OROW vegetation contributed significantly to the interruptions in both years. Out of nearly 602,000 vegetation-related customer interruptions in 2018 through 2019, OROW vegetation was responsible for approximately 80% of those interruptions that occurred on the distribution system.[11]

Q50. HOW IS THE COMPANY PLANNING TO CONDUCT THE OROW PROGRAM?

A. Leveraging customer-focused information and new technologies, the Company is improving its ability to identify, log, and analyze potential OROW vegetation hazards. The Company will identify clusters of danger trees and then prioritize the removal work based on expected reliability benefits to customers. As mitigation work is completed and new potential hazards are identified in the course of the Company's distribution and transmission projects, ELL can adjust the prioritization of OROW work if necessary. Of

[11] Approximately 580,000 of the nearly 602,000 vegetation-related customer interruptions in the 2018-2019 period arose from issues on the distribution system.

the [redacted] annual spending that the Company proposes for the OROW program, [redacted] will be targeted to addressing OROW vegetation on the distribution system, with the remaining [redacted] targeted to the transmission system, for a total three-year program cost of [redacted].

Q51. WHAT ARE THE ANTICIPATED BENEFITS OF THIS EFFORT TO MITIGATE OROW VEGETATION HAZARDS?

A. Improved reliability is the primary benefit, and we expect that the program will reduce customer interruptions and customer minutes interrupted. When OROW vegetation comes in contact with the Company's conductors or structures, the resulting outages often have longer durations before service can be restored safely. For example, outages caused by OROW vegetation often happen during severe weather events, when the ability to access the fault location and make necessary repairs can be limited. Thus, the Company expects that its proposed OROW program will not only lead to a reduction in customer interruptions, but it also will reduce the number of longer-duration outages. Furthermore, the program's more proactive approach to danger tree removal should improve efficiency and allow more circuits to be addressed, thereby improving system resiliency and reducing future reactive repair costs.

Q52. WILL THE COMPANY TRACK THE RESULTS OF THIS EFFORT?

A. Yes, the Company plans to track and analyze the impacts on the reliability of associated circuits and will summarize these results in an annual report. Further, at the end of the three years, the Company will evaluate the impacts of the effort and make a

recommendation regarding an appropriate strategy for managing OROW challenges going forward.

Q53. HOW IS THE COMPANY REQUESTING TO RECOVER EXPENSES RELATED TO THIS EFFORT?

A. I expect that this three-year effort will reduce customer interruptions and customer minutes interrupted caused by OROW vegetation, reduce future repair costs, and improve customer reliability for an extended period of time. Coordinating this effort with the increased investment in the distribution system that I discussed above presents a unique opportunity that will benefit our customers. Accordingly, as Messrs. May and Thomas discuss, the Company is requesting to defer expenses relating to the OROW program as a regulatory asset to be amortized into rates over a ten-year period.

VI. CONCLUSION

Q54. PLEASE SUMMARIZE YOUR TESTIMONY.

A. ELL plans to invest approximately [redacted] over the next four years investing in its distribution infrastructure, more than [redacted] the average level of investment over the past 7 years. The investment levels are projected to increase because changes in customer expectations and grid technologies are occurring at a time when ELL's distribution grid assets are at or approaching the end of their lives. As I've described, ELL has responded to this phenomenon by developing a distribution plan that involves significant investments in ELL's reliability infrastructure, which represents roughly [redacted] of the projected [redacted] [redacted] over the next four years. Overall, the improvement in both short-term and long-

term sustainable reliability and improvements in grid resilience will favorably impact the quality and consistency of service ELL provides to its customers and offer the foundation to support customer expectations of new products and services. Commission approval of the DRM will be instrumental in allowing the Company to execute on its distribution plan and continue to achieve an effective balance between productive investments, reliability, and customer service.

Q55. DOES THIS COMPLETE YOUR DIRECT TESTIMONY?

A. Yes, at this time.

AFFIDAVIT

STATE OF LOUISIANA

PARISH OF VERMILION

NOW BEFORE ME, the undersigned authority, personally came and appeared, **Anthony P. Arnould, Jr.** who after being duly sworn by me, did depose and say:

That the above and foregoing is his sworn testimony in this proceeding and that he knows the contents thereof, that the same are true as stated, except as to matters and things, if any, stated on information and belief, and that as to those matters and things, he verily believes them to be true.

Anthony P. Arnould, Jr.

SWORN TO AND SUBSCRIBED BEFORE ME
THIS 18th DAY OF MAY, 2020

NOTARY PUBLIC
Carla Foley
#66198

My commission expires: at death, unless revoked

BEFORE THE

LOUISIANA PUBLIC SERVICE COMMISSION

ENTERGY LOUISIANA, LLC, *EX PARTE*. APPLICATION OF ENTERGY LOUISIANA, LLC FOR EXTENSION AND MODIFICATION OF FORMULA RATE PLAN	**)** **)** **)** **)** **)**	**DOCKET NO. U-_____**

EXHIBIT APA-1

HIGHLY SENSITIVE
PROTECTED MATERIALS
FILED UNDER SEAL

INTENTIONALLY OMITTED

MAY 2020

Entergy
ENTERGY LOUISIANA, INC.

University City Feeder Backbone