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September 29, 2016

Via Hand Delivery
Honorable Lora W. Johnson
Clerk of Council
Council of the City of New Orleans
City Hall, Room 1E09
1300 Perdido Street
New Orleans, Louisiana 70112

RE: ***Entergy New Orleans, Inc.'s Final Report in Response to Council Resolution R-15-31***
(CNO Docket No. UD-12-04)

Dear Ms. Johnson:

Enclosed please find an original and three copies of the Entergy New Orleans, Inc.'s Supplement to Final Report in Response to Council Resolution R-15-31 in the above-referenced docket. Please file an original and two copies into the record in the above-referenced matter, and return a date-stamped copy to our courier.

Thank you for your assistance with this matter.

Sincerely,

Timothy S. Cragin

Enclosure

cc: Official Service List UD-12-04 *(Via Electronic Mail)*

RECEIVED
SEP 2 9 2016
BY: Angela Barker

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BEFORE THE

COUNCIL OF THE CITY OF NEW ORLEANS

IN RE: AN INQUIRY AND FACT FINDING INTO ENTERGY NEW ORLEANS, INC. AND ENTERGY LOUISIANA, LLC'S POST-HURRICANE ISAAC RESPONSE AND STORM RECOVERY MATTERS	**))))))**	**DOCKET NO. UD-12-04**

ENTERGY NEW ORLEANS, INC.'S SUPPLEMENT TO FINAL STORM HARDENING REPORT IN RESPONSE TO COUNCIL RESOLUTION R-15-31

Entergy New Orleans, Inc. ("ENO" or the "Company") submits this Supplement to the Final Storm Hardening Report ("Supplement") that it filed on January 21, 2016 in response to Council Resolution R-15-31 (the "Storm Hardening Resolution"). This Supplement is being filed in the original Hurricane Isaac Inquiry docket, UD-12-04, and is simultaneously being submitted as an attachment to ENO's Response to the Council of the City of New Orleans ("Council") Resolution R-16-263 (the "Show Cause Resolution"), in which the Council ordered ENO to show cause regarding the reasonableness of its actions with regard to, *inter alia*, its response to the Storm Hardening Resolution.

I. Background

ENO filed its initial report, responding to Ordering Paragraphs 2, 6, and 7 of the Storm Hardening Resolution, with the Council on March 23, 2015 ("Initial Report"). ENO's second report, filed with the Council on May 22, 2015 ("Second Report"),[1] contained the information

[1] The Initial and Second Reports were filed on behalf of ENO and the then-Council-jurisdictional portion of Entergy Louisiana, LLC ("ELL") serving the Fifteenth Ward of Orleans Parish, known as Algiers. In September 2015, ENO acquired the assets of ELL located in Algiers and, accordingly, the Final Report was submitted only on behalf of ENO, but included, where available, information related to ENO's operations in Algiers.

from the Initial Report with minor changes and added ENO's response to Ordering Paragraphs 1, 4, and 5. ENO then filed a Final Report on January 21, 2016 that included ENO's updated responses to each of the Ordering Paragraphs 1, 2, 4, 5, 6, and 7 addressed in the Initial Report and the Second Report, and added ENO's response to Ordering Paragraph 3. The Final Report also included conclusions and recommendations regarding system hardening measures that could be undertaken in 2016, 2017 and 2018.

As described in more detail below, this Supplement seeks to provide additional detail regarding the manner in which ENO seeks to carry out its Storm Hardening proposal, including certain revisions to its initial proposal, and to discuss certain issues that have been raised by members of the Council or discussed informally with the Council Advisors. Because ENO seeks input and guidance from the Council regarding its Storm Hardening proposal before moving forward with the extensive work contemplated by the plan, ENO is proposing to move approximately $1.8 million of spending initially proposed for 2016 to 2018 and have all of the spending and work associated with the plan take place in 2017 and 2018, $14.1 million and $15.9 million, respectively. A chart reflecting the proposed revised spending plan is attached at Exhibit 1. It should be noted at the outset that as work proceeds under this proposal, and as ENO gains experience with implementing the plan, it may be appropriate to move dollars between years or between categories to achieve the best possible results for our customers and the electric system that serves them. If the Council approves ENO's proposal, ENO intends to work continually with the Council and its Advisors on this and other issues that may evolve over time.

II. Overview

This Supplement to the Final Report includes the following: (1) a recommendation that approximately $3 million originally allocated to selective undergrounding projects in Algiers and near the Midtown substation in the Storm Hardening proposal ENO previously submitted to the Council in January 2016 be re-allocated to Circuit Reconfiguration, including an explanation for the recommended change; (2) additional detail regarding how ENO intends to prioritize and implement its Storm Hardening proposal (as revised per the above); (3) a discussion of the incremental reliability measures undertaken so far in 2016 to address operational challenges presented by weather patterns experienced this year; (4) a discussion of Entergy's review of the possible use of composite poles for some construction scenarios; (5) a discussion of possibilities regarding long-term storm hardening measures that could be pursued after ENO's three-year proposal terminates at the end of 2018 (including a limited discussion of the Florida Power & Light storm hardening program); and (6) a brief discussion of the Advanced Metering Infrastructure proposal that ENO intends to file in mid-October 2016.

III. Revisions to Storm Hardening Proposal – Proposed Re-allocation of Selective Undergrounding Dollars to Circuit Reconfiguration

In the Storm Hardening proposal submitted with its Final Report, ENO proposed to spend approximately $3 million on selective undergrounding work relating to: (1) installing two new underground circuits in the Mid-City area from the Midtown Substation through an existing underground duct bank along Interstate 10 in an effort to shift existing customer load on overhead facilities and reduce customer counts per feeder; and (2) conducting a pilot program involving the selective undergrounding of existing overhead facilities located in Algiers. After the Final Report was filed, ENO began reviewing these projects with a view toward implementation, but ultimately determined that the $3 million initially allocated to these selective undergrounding projects could be better spent on reconfiguring certain circuits in a manner that will allow customers to be served more efficiently, while simultaneously eliminating portions of the overhead infrastructure and thereby removing such infrastructure from any possible exposure to storm damage.

A. Reallocation of Mid-City Undergrounding Dollars to Circuit Reconfiguration

As noted above, after the filing of the Final Report, ENO re-evaluated its proposal to route two new underground circuits through approximately one mile of existing duct bank along Interstate 10 and concluded that the goal of reducing customer counts per feeder in the Mid-City area could be accomplished more simply and less expensively by the construction of minimal new overhead facilities in the immediate area of the Midtown substation and adding two new feeder breakers at the station (as opposed to pulling six runs of cable (*i.e.*, two 3-phase circuits) for approximately one mile underground). Additionally, ENO determined that the spare capacity within the existing underground duct bank could be better utilized for longer-term projects to route additional circuits from Midtown substation to serve the area near the new University Medical Center ("UMC") and Veterans Administration ("VA") Hospitals on Tulane Avenue, which is projected to experience continued economic development and load growth. Accordingly, it is recommended that the dollars initially allocated to the Mid-City undergrounding project be reallocated to the Circuit Reconfiguration initiative, which is described in more detail below.

B. Reallocation of Algiers Undergrounding Dollars to Circuit Reconfiguration

With the overall goal of improving system reliability with a fiscally responsible investment, initial criteria were set for selecting an Algiers circuit for undergrounding, including:

1. <u>Rear alley construction</u>: Overhead lines built in the rear of properties pose a significant challenge to utility crews when attempting to restore power. Often times these circuits are very difficult to access with machinery and are obstructed by property owners encumbering the right-of-way with patios, decks, sheds and pools. All of these challenges make it more difficult to restore customers served from such a configuration in a timely fashion.

2. Past vegetation issues: Vegetation-related outages make up a large portion of the overall outages in the Algiers area. A rear alley circuit with heavy surrounding vegetation would be an ideal candidate for undergrounding for many of the same reasons mentioned above.

3. Ability to create an underground "loop": Many overhead circuits that feed customers are "radial" feeds, meaning that the power flow is only in one direction. An outage at the beginning of the feed translates into outages for everyone beyond the tripped or damaged equipment. This is a common practice due to the ability to identify and repair faulted overhead line sections quickly and effectively. Underground systems are not afforded that same luxury. It is much more difficult to identify faulted line sections and much more time-consuming to repair once identified. Because of this, most underground feeds will need to be "looped" so that power flow can be bi-directional and faulted sections can be isolated without affecting large numbers of customers.

Based on these initial criteria, a rear alley lateral circuit was selected on feeder W0722 out of the Holiday substation in Algiers. Located in the rear of houses facing Valentine Court and St. Nick Street, this lateral circuit met all three of the initial criteria and was a middling performer based on 2014 reliability information.

- The overhead single-phase lateral circuit is rear alley construction and directly feeds nearly 100 residential customers.

- Review of past outage information records and discussions with the area's reliability servicemen indicated that this lateral circuit consistently experiences vegetation-related outages.

- The feeder backbone is on the opposite end of the lateral circuit. This allows for transition to an underground "loop" feed.

After the initial circuit selection was completed, an effort was made to capture and document all possible barriers to undergrounding the identified circuit. Preliminary meetings identified several of these barriers:

- Existing right-of-way ("ROW") documents would need to be amended to allow for the installation of underground facilities in place of the existing overhead. All affected home/land owners would need to approve the right-of-way changes for the project to move forward.

- Adequate space and the ability to access the ROW is crucial to the success of the project. In many instances, homeowners have encumbered the existing ROW with storage sheds, plantings and swimming pools. A detailed field inspection is also necessary to determine if and where ENO can permanently place pad-mounted transformers and set up equipment for installation of the underground primary line.

- Access to the rear alley lines is very limited and may require the removal of fences and other structures to allow for access to the ROW and the installation of new facilities. Property damage claims are highly possible but difficult to estimate.

- ENO's practice is to make underground service available for customers who are willing to comply with ENO's Customer Installation Standards for underground service. Compliance with these standards would result in the customer bearing the cost to replace their existing overhead service entrance equipment (meter base) and installing a service entrance meter base appropriate for underground service, along with installing appropriate conduit to a point 24" from the transformer pad or secondary pedestal. Customers who do not wish to convert to underground service would need to continue to be fed via an overhead service line to their existing service entrance equipment.

ENO discussed these concerns with the Council Advisors after the Final Report was filed and ENO indicated that it would go back and see if the circuit selection criteria might be changed to potentially eliminate some of these barriers. To that end, ENO changed its selection criteria to the following:

1. <u>Poor reliability performance:</u> By targeting poor-performing circuits for selective undergrounding, ENO could realize a greater performance improvement and better demonstrate the benefits of the selection.

2. <u>Ability to install in existing ROW accessible by street:</u> ROW acquisition is a challenging hurdle to any selective undergrounding project. By targeting sections of overhead line that would allow for easy transition into franchised servitudes, a major barrier in the initial selection criteria could be eliminated.

3. <u>Focus on backbone circuits and areas of frequent public inflicted damage:</u> Damage to backbone circuits is the primary cause of outages affecting large numbers of customers. In many instances, these backbone circuits are susceptible to damage by the public, specifically by vehicles hitting

poles. Identifying areas with high rates of PID could provide opportunities to improve feeder performance through undergrounding.

With the updated selection criteria, ENO was able to identify a few possible additional selective undergrounding opportunities in the Algiers area. However, after further review of these circuits, ENO determined that, while each met some of the revised circuit selection criteria, none of the circuits could realize substantial benefit from a system reliability and storm hardening perspective. Each circuit was ranked relatively high in the System Average Interruption Duration Index ("SAIDI") and System Average Interruption Frequency Index ("SAIFI") performance matrix (*i.e.*, relatively better SAIDI/SAIFI scores), and each fed more customers downstream of the proposed undergrounded section that were located outside of ENO's Algiers' service area than inside.

With the ultimate goal of this initiative being to improve ENO system reliability and resiliency when faced with storm conditions in a fiscally responsible and cost-effective manner, ENO recommends that the funds initially identified for selective undergrounding in Algiers also be re-allocated to the Circuit Reconfiguration initiative of the Storm Hardening Plan described below.[2]

C. Allocation of Dollars to Circuit Reconfiguration

A cost-effective method of mitigating the potential impact of outages is to permanently reconfigure the overhead distribution circuits in such a way that fewer customers are served by

[2] It should be noted that in an effort to better understand best practices regarding the undergrounding of electrical facilities for the purposes of storm hardening, ENO reached out to representatives at Florida Power & Light Company ("FP&L"), a utility nationally recognized (and specifically cited in the Show Cause Resolution) for its storm hardening initiatives, for insight into its practices and procedures. A significant component of FP&L's undergrounding program is the incorporation of input from municipalities and specific communities on whether undergrounding is desired, including the use of voting procedures. Additionally, FP&L coordinates with municipal and county governments on the assessment of the costs of undergrounding to the customers and on the placement of facilities. ENO believes that any future efforts by ENO to incorporate significant undergrounding in New Orleans should consider the procedures used by FP&L and whether such procedures could be used in New Orleans.

each feeder. This results in fewer customers being impacted by an outage of the substation feeder breaker or an equipment failure along the circuit backbone. This can be accomplished through the combination of several tactics: 1) installation of additional distribution feeder breakers at substations to provide new source options; 2) construction of new overhead circuits to provide alternate sources to adjacent facilities; and 3) installation of new “normally open” or “normally closed” line switches to provide sectionalization points for moving customers to service from an alternate source. A further benefit to this type of circuit reconfiguration is the added flexibility to manually or automatically switch customers to a temporary alternate source following an outage, thereby reducing the outage duration for those customers while repair work is being performed.

The ENO Storm Hardening Plan includes the addition of two new distribution feeder breakers at the Midtown substation, along with the construction of minimal spans of new overhead wire and the installation of several new line switches. This work will allow ENO to permanently shift customers from two existing feeders in the Mid-City area to service from the two new circuits from Midtown. Based on current customer counts on the feeders in the area, it is estimated that ENO could reduce customer counts from approximately 2,000 on each of the two existing feeders to approximately 1,000 each on the two existing feeders and two new Midtown feeders. This would effectively reduce the impact of a feeder outage in the area by half.

In addition to the reduction of the number of customers affected by an outage, ENO’s Circuit Reconfiguration initiative includes work to reduce exposure to potential outages by eliminating unnecessary overhead distribution equipment. There are several locations on the ENO distribution grid where “dead wire,” which no longer provides power to customers, remains installed on the poles. In other locations, lateral circuits and secondary service circuits that historically were created to follow load, could now be routed more efficiently, thereby eliminating unnecessary cross arms and spans of wire by optimizing the number and locations of transformers. Through circuit reconfiguration, this extra equipment can be removed without affecting the load capacity of the primary circuits or the flexibility of the distribution system to switch load following an outage. The removal of this equipment exposure could result in a significant reduction in the frequency and duration of outages during a major weather event.

In summary, it is recommended that the approximately $3 million dollars originally allocated to selective undergrounding in ENO's Final Report be reallocated to Circuit Reconfiguration.

IV. ENO's Plan for Prioritizing Work on Its Storm Hardening Proposal

The primary focus of ENO's Storm Hardening proposal will be to enhance the rigidity and resiliency of the feeder circuits providing power to its Critical Customers. This is a similar approach to what has been implemented over the past ten years in the storm hardening activities of Florida Power & Light Company, a utility generally recognized as an industry leader in the area of storm hardening.

In order to aid storm restoration efforts, ENO maintains a prioritized list of Critical Customers, their physical addresses, and the ENO facilities which provide primary electrical service (and standby service, where applicable) to those customers. The list is updated as necessary, and it is compiled with input from the New Orleans Office of Homeland Security and Emergency Preparedness. During restoration, the facilities serving the customers on the list are prioritized according to the following five categories:

Priority Zero (0) – Facilities important to Entergy's restoration process (Supporting supply lines to generation units, supporting Centralized Dispatch centers, emergency response centers such as Network/Region/State Command Centers, Customer Information Centers);

Priority One (1) – Facilities that impact the risk to public safety or public health (Primary feeds to hospitals, local emergency preparedness centers, police/fire stations, major sewer/water systems, Red Cross or other potential emergency housing facilities, such as churches);

Priority Two (2) – Facilities that impact Civil Defense (Military facilities, radio/TV stations, airports, major land line and cell phone communications systems, major government facilities, oil and gas facilities that have national impact);

Priority Three (3) – Facilities that impact customers on Entergy's Medical Assistance list, including nursing homes, assisted living facilities, after hours care facilities; and

Priority Four (4) – Facilities serving all other customers.

ENO proposes to use the information from the Critical Customer list as the primary criteria for prioritizing storm hardening work on its electrical distribution system, taking into account the number of Critical Customers served by each feeder, as well as each feeder's prioritization category. Other criteria which will be considered for prioritizing storm hardening work are: total number of customers served by the feeder; number and location of structures identified for replacement as part of ENO's annual pole inspection program; number, location, and historical reliability performance of protective devices identified as part of ENO's tactical reliability review and inspection program; and opportunities for sectionalization of customers on a feeder through the installation of additional overcurrent protective devices. Separate prioritization lists will be maintained for the East Bank and West Bank areas of the ENO service territory. As the topology of the ENO Distribution system evolves, or as the population or location of Critical Customers changes, the prioritization lists will be updated and the execution of the plan will be adjusted accordingly. The current prioritized feeder lists for the East Bank and West Bank are attached hereto as Exhibit 2.

Hardening of each feeder on the prioritized list will be addressed in the order of prioritization, and the area of focus of the hardening work for each feeder will be along the main trunk, or “backbone”, of the circuit between the Distribution substation and the point of service to the Critical Customer(s). In cases where a Critical Customer is served from a primary voltage tap-off from the backbone, or “lateral”, the facilities on the lateral part of the circuit up to the point of service will also be included in the focus area. Secondary voltage equipment serving the Critical Customer will also be included in the hardening scope.

With this method of prioritization of work as the foundation, each of the pieces of the Storm Hardening proposal will be addressed in more detail below.

A. Enhanced Pole Inspection

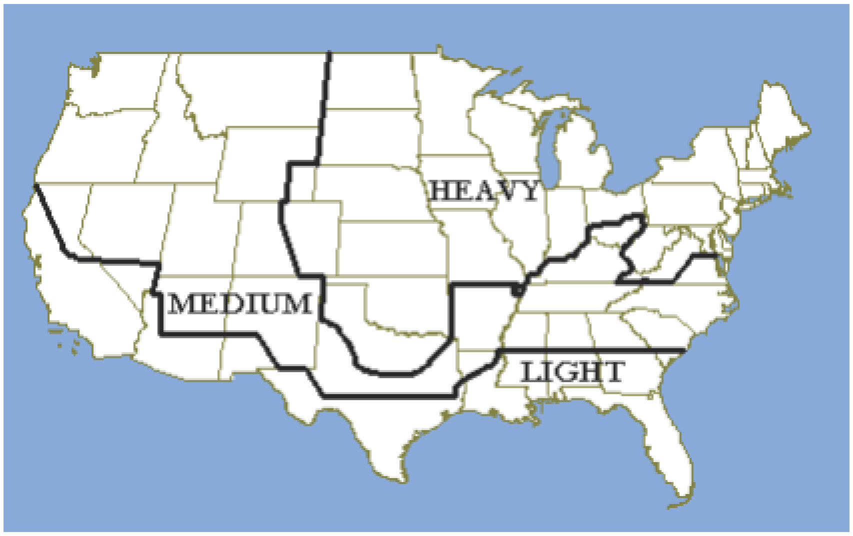
In its Final Report, ENO proposed spending $11.1 million on an enhanced pole inspection program that utilizes full excavation and that treats or replaces poles as appropriate based on excavation results. ENO has begun full excavation inspections in 2016, but has not used dollars associated with this Storm Hardening proposal to do so. That is, ENO has used 2016 funds already budgeted for pole inspections to perform the full excavation inspections. Based on these initial full excavation inspections (approximately 2,000 in Orleans Parish), ENO has experienced a pole reject rate of approximately 12%, up from about 2% when the sound and bore technique was being used. This pilot was chosen to validate an expected increase in effectiveness in identifying reject poles from approximately 50% to 60% using the Sound and Bore methodology, to approximately 98% using full excavation. Full excavation also provides the opportunity to apply treatment to significantly extend the life of the pole, potentially by as much as 60%. In moving forward with the Storm Hardening proposal, ENO intends to focus its pole inspections on feeders serving critical customers.

ENO's pole inspection vendor, Osmose Utilities Services, Inc. ("Osmose"), also performs loading analysis on questionable poles to determine if the remaining strength in the pole exceeds the required strength based on the type of structure and the load of the structure. In addition, ENO utilizes structural analysis software, called PoleForeman (discussed in more detail below), to analyze poles being installed or replaced to verify that they meet strength requirements given the specific circumstances of the installation. This enhanced pole inspection and replacement program will serve to ensure poles are treated, reinforced, or replaced prior to significant rot or degradation. The new inspection process is expected to increase the pole reject rate, which will expedite the asset renewal of the pole population and allow for more opportunity to harden ENO distribution facilities.

B. Storm Hardened Pole Replacements and New Construction

As is typical in the industry, ENO designs and constructs its electric facilities to meet or exceed the requirements of the National Electric Safety Code ("NESC"). The NESC sets forth standards that are considered necessary for the safety of the utility employees and the public which they serve. The focus of the NESC is on the safety of employees and the public and is not intended to set forth a standard for electric reliability. The code instructs designers in the areas of clearances, construction grades, loading, strength, grounding, and safe work practices, among other things. To assist in designing jobs to meet or exceed NESC requirements, Entergy has acquired a software application called PoleForeman, developed by PowerLine Technology, Inc.

As defined by the NESC, general loading districts specify the weather conditions a structure and supporting facilities should sustain. The NESC loading district map is shown below.



Per the NESC map, approximately 75% of Louisiana – and all of ENO's service area – is located in the NESC light loading district. Associated with each loading district is a defined temperature, anticipated wind speed, and radial thickness of ice loading that electric utilities can reasonably anticipate to experience on their electric systems. The temperature, wind, and ice conditions that ENO uses in its current distribution pole analysis calculations are shown below under the NESC "light" loading district.

NESC LOADING DISTRICT	Temperature (°F)	Wind Loading (lbs/ft²)	Ice Loading (in)
HEAVY	0°	4	0.50
MEDIUM	15°	4	0.25
LIGHT	30°	9	0.00

Per NESC Rule 250B, the data specified above is used as design conditions and mechanical loads for distribution structures not exceeding 60 feet above the ground line. For example, if a new power pole was to be set in Algiers (located in the NESC light loading district), the conductor tension used for pole loading and guying calculations would be the tension at 30 degrees Fahrenheit with 0.00 inches of ice accumulation and 9 pounds per square foot ("psf") (60 miles per hour ("mph")) of wind. Meaning, the new pole is designed to withstand, at a minimum, the forces of a 60 mph wind and not fail. All ENO poles meet or exceed the appropriate NESC requirements in effect in the year of their installation. All new distribution poles set in ENO's service territory currently meet, at a minimum, the requirements of NESC Rule 250B.

In conjunction with this docket, the Council is seeking information regarding the possible enhancement of current practices to achieve an increased level of structural rigidity during a storm event and overall system reliability, which is herein collectively referred to as "storm hardening." In its Show Cause Resolution, the Council pointed ENO to the storm hardening activities of Florida Power & Light Company ("FP&L"). FP&L, which employs over 10,000 people and serves almost five million~~s~~ customers, is recognized as a national leader in storm hardening initiatives. Over the last ten years, FP&L has spent over a billion dollars implementing storm hardening measures on feeders and other facilities that serve critical infrastructure customers throughout its 35-county service territory. Based on conversations between ENO representatives and FP&L representatives, FP&L has, over this ten-year period, utilized outside consulting firms and has hired several hundred design engineers and other personnel to assist in planning, designing and implementing its storm hardening program.

One of the measures that FP&L has implemented is the use of NESC Rule 250C's Extreme Wind Analysis for new construction and pole replacements, when feasible and cost effective. NESC Rule 250C's Extreme Wind Analysis is typically only required for structures that exceed 60 feet above the ground line; however, FP&L, which experienced multiple significant hurricanes in its service territory in the 2004 and 2005 time frame, has chosen to design pole replacements and new construction serving critical customers to NESC Rule 250C Extreme Wind Loading standards – again, when feasible and cost effective to do so.

For ENO's service area, the difference between designing jobs based on Rule 250B, a 60 mph minimum design standard, and Rule 250C, a 120 to 130 mph standard, could be significant in terms of increased system rigidity, but also increased cost. The American Society of Civil Engineers ("ASCE") is the governing body that determines the minimum design loads for buildings and other structures in the United States. The latest version of the ASCE Standard is ASCE 7-10. The following website: http://www.atcouncil.org/windspeed/ provides a tool that allows one to put in an address and determine the probabilities of wind speeds over certain periods. For instance, if one puts in New Orleans, Louisiana, the results are as follows:

Mean Recurrence Interval ("MRI") 10-Year: 81 mph

MRI 25-Year: 96 mph

MRI 50-Year: 108 mph

MRI 100-Year: 118 mph

A mean recurrence interval of 50 years yields a wind speed of 108 mph. This suggests that, based on historical wind speeds and probabilities, we could expect to experience a wind speed of 108 mph once every 50 years. Or, put another way, there is a 2% chance in any one year that we would experience a wind speed of 108 mph. The probabilities for the other MRI's above are calculated similarly. For example, a 10-year MRI wind speed of 81 mph would be expected to occur once every 10 years, or there is a 10% chance of 81 mph winds in any one year, and so on. Of course, as noted, these are based on historical data and statistical probabilities and there is no guarantee that New Orleans will not experience higher wind speeds or that the 50-year MRI wind speeds will not occur more frequently than statistics and history might suggest. Nevertheless, based on an unscientific review of internet websites showing historical wind speeds, in approximately the last decade, New Orleans has experienced maximum sustained winds of 70 mph and maximum gusts of up to 86 mph. Accordingly, ENO believes that designing pole replacements and new construction to a 120 mph to 130 mph design standard might be unnecessary. Therefore, ENO proposes to evaluate pole replacements and new construction jobs using PoleForeman,[3] or other appropriate tools, methods, or technology, for extreme wind speeds of 110 mph (*i.e.*, exceeding the ASCE 7-10 50-year MRI wind speed (2% annual probability)) and to design such jobs to that standard, where feasible and cost effective. Notwithstanding the foregoing, ENO intends to use Class 3 poles or larger for any pole replacements and new construction.

It must be noted, however, that while ENO's distribution facilities themselves can be designed and constructed to withstand this level of wind exposure, surrounding structures and objects such as buildings, billboards, and trees may not be able to withstand the same wind loading. This could result in possible damage to the hardened ENO facilities from objects

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[3] PoleForeman is a structural analysis engineering software package used by electric utilities to help design and maintain wood utility poles. With PoleForeman, designers are able to determine the pole height and pole class required to safely support overhead power conductors and communication cables. The length (height) of a utility pole is determined by the vertical clearances required to keep the power lines and telephone lines a safe height above the ground and/or roadway. The pole class specifies how large (strength) the pole needs to be to safely support the conductors, cables, and transformers that are commonly attached to the poles.

The PoleForeman software makes the task of calculating pole length and pole class a relatively simple process. Designers input the required parameters for the structural model and then run the analysis. The software determines if the proposed pole (length/class) has adequate size to meet the minimum strength requirements outlined in the National Electrical Safety Code ("NESC"). PoleForeman software can also be used to model Extreme Wind scenarios under NESC Rule 250C.

There are a number of variables that impact the loading on utility poles. These variables include: span lengths, line angles, conductor sizes, communication cable sizes, attachment heights, conductor and cable tensions, anchor lead lengths, transformer sizes, street lights, etc. In addition, a typical utility pole may support facilities belonging to two or more different entities. As a result, cooperation and the sharing of information is required between all parties to determine if a particular utility pole can safety support the attachments.

outside of the right-of-way during extreme weather conditions, and outages may still occur as a consequence.

Examples of storm hardening could include installation of stronger pole structures (class 2 vs. class 3), use of additional down guys and anchors, installation of stronger cross arms (fiberglass vs. wood), and improving the Basic Insulation Level ("BIL") of an installed structure. Storm hardening efforts could also include the reconfiguration of existing overhead facilities and the deployment of technology to enhance the resiliency of the electrical system and aid in quicker and more efficient outage restoration, as discussed in more detail below. ENO's Storm Hardening proposal considers each of these aspects in developing the scope of work for each facility to be hardened and will implement specific solutions that are reasonable, have minimal negative impacts to customers, and provide the most reliability value relative to cost.

C. Targeted Storm Hardening Reliability Measures

ENO has proposed allocating $10.8 million to Targeted System Hardening measures. ENO intends to focus these measures on infrastructure serving critical customers.

The Targeted Storm Hardening initiative identifies through visual inspection structures which have damaged equipment attached such as "flashed" insulators or rotting cross arms, or which do not meet current Entergy reliability standards for BIL to mitigate the effects of lightning strikes. Under current reliability practices, when inspections reveal flashed insulators or rotting cross arms, these facilities would be replaced, and the pole would be brought up to current Entergy standards for BIL. In order to design the job to perform this work, the pole would be modeled in PoleForeman using the standard NESC loading analysis rule for the area (Rule 250B). The equipment would likely be replaced in kind since the structure and its attached equipment were originally designed and installed using the same standard loading rule.

Under the proposed Targeted Storm Hardening initiative however, the pole would be analyzed using an extreme wind analysis target for a designed wind loading of 110 mph. This analysis may identify additional work necessary to design and install a structure to meet these hardened requirements, such as installing additional guying and anchoring or even upgrading the strength class of the pole. While pole loading analysis results will differ from location to location and show different components to be deficient under an extreme wind analysis, ENO's intent will be to design and install a structure and attached equipment that can withstand wind speeds of 110 mph, unless due to other circumstances specific to the job such hardening is not considered feasible or cost effective.

D. Sectionalization and Automation

ENO has proposed allocating $5.2 million to Sectionalization and Automation storm hardening measures. ENO intends to first focus these measures on infrastructure serving critical customers.

While the physical upgrading of the Distribution system equipment is a crucial part of any storm hardening strategy, another important aspect is the enhancement of the resiliency of the system through the utilization of technology. It is unrealistic to expect that any electrical Distribution system, however physically hardened, will be able to withstand a major storm event without experiencing outages. Therefore, it is important to supplement physical hardening of assets with the implementation of sectionalization devices and automation that can reduce the number of customers affected by storm damage to a particular piece of equipment, as well as the duration of the outage experienced by those customers.

The addition of reclosers on the backbones of Distribution feeders will reduce the number of customer interruptions by sectionalizing the circuits into smaller segments with coordinated overcurrent protection and fewer customers per protective device. Installing Supervisory Control and Data Acquisition ("SCADA") capabilities on these new and existing field reclosers will enable remote switching from the Distribution Operation Center ("DOC"), reducing the duration of outages which can be restored without dispatching a service crew to the location. The installation of more field reclosers with communication capabilities also provides opportunities to install new Automated Load Transfer ("ALT") schemes, which can be utilized to further minimize customer interruptions and outage durations by automatically performing field switching to serve customers from another source when their normal feeder circuit experiences an outage.

Installing fault indicators on Distribution feeders can also result in improved response time and shorter outage durations. When a fault occurs which causes an outage, these devices provide information remotely to the DOC or directly to a service crew in the area which is used to determine the approximate location of the fault condition which originally caused the outage. This eliminates the need for inspection of an entire circuit downstream of the operating protective device to locate the source of the trouble. A service crew can be dispatched directly to the area where the fault is suspected to have occurred, and restoration work can begin much more quickly, reducing the total outage duration.

E. Circuit Reconfiguration

ENO has proposed allocating approximately $3 million towards Circuit Reconfiguration measures. Circuit reconfiguration is discussed above in the section pertaining to revisions to the original proposal.

V. Incremental Reliability Measures Undertaken in 2016

It is no secret to New Orleans residents that 2016 has been an incredibly wet year. At several points throughout the year, recurring weather patterns seemingly delivered thunderstorm after heavy thunderstorm on an almost daily basis on our City. These near daily beatings by Mother Nature have had an adverse effect on system reliability in the City and, at times, ENO and some of its customers have experienced the aggravating inconveniences associated with temporary outages. As a result, around mid-year ENO management determined that it would allocate approximately $10 million of incremental dollars (*i.e.*, dollars not originally included in the 2016 budget) to be spent in 2016 executing targeted reliability initiatives.

ENO planned this incremental reliability work over the course of the summer, retained approximately ten 4- and 5-person contract crews to assist Entergy crews in designing and performing the work, and is in the process of performing the work necessary to strengthen the reliability of ENO's system. An overview of the plan for accomplishing this targeted reliability initiative is attached as Exhibit 3 hereto. It can be noted that some of the work being performed under this reliability initiative is of the same or similar nature as some of the storm hardening initiatives detailed herein. Moreover, the manner in which this reliability work was planned and designed is similar to how the storm hardening work will be planned and designed, except that the storm hardening work will focus on critical infrastructure, whereas the reliability work focused primarily on backbone feeders serving over 1,500 customers. For example, in preparing for the reliability work, ENO personnel or contractors must first go and closely inspect the targeted feeders to determine what reliability work needs to be done on them. A copy of the backbone inspection form used in this process is attached as Exhibit 4. A copy of the specific pole inspection form is attached as Exhibit 5. It shows that the poles are inspected for a multitude of potential problem areas including estimated basic insulation level, location and type of pole, structure type, bad pole (top or bottom), bad cross arm, bad cross arm brace, deterioration of fiberglass standoff arm, damaged or flashed insulators, loose guy wires, bad anchors, guy strain insulator, lightning arrestor, fuse switches, ground wire, need for Hendrix ground, missing or damaged pole ground, unfused lateral or transformer, animal guard, slack conductor, missing neutral/shield (spans), conductor damage, AAAC sleeve on 336ACSR conductor, damage to disconnect switch, GOAB switch damage, vegetation issues, and any other issues. The same or similar inspection process will be used to examine the feeders serving critical infrastructure customers for the storm hardening initiative. ENO believes that this reliability initiative will complement the storm hardening initiatives proposed herein. Moreover, if ENO receives Council approval of its storm hardening plan in 2016, ENO can transition some or all of the contractor crews retained for the reliability work to the storm hardening work in 2017. This is important as there is a seeming increase in hardening related work in the Gulf South and it can be difficult to get and retain quality work crews in a time where there is a high demand for their services.

VI. ENO's Ongoing Review of Composite Poles – Pros and Cons

Although the Storm Hardening Resolution does not directly address the possible use of composite poles as a hardening measure, in the course of this proceeding, ENO has received questions from certain Councilmembers regarding the possible use of composite utility poles in ENO's service area. Accordingly, this Supplement will briefly address ENO's review of composite poles for possible use in New Orleans.

Since late 2015, ENO has been in the process of learning more about composite poles and evaluating the feasibility, suitability, and possible benefits of the use of such poles in ENO's service area. ENO representatives have reviewed industry publications regarding the use of composite poles and have discussed the use of composite poles with another utility that used composite poles for approximately 10 years. In late 2015, Entergy provided composite pole specifications to manufacturers, ordered approximately 200 composite poles, and arranged to train ENO crews on the handling, installation and maintenance of these poles. To date, design engineers in New Orleans have designed 45 jobs to install composite poles in Orleans Parish. In general, composite poles are being designed to replace wood poles that are difficult to reach via bucket truck (e.g., rear alley location, wet areas), areas where significant BIL improvements can be made, and areas where there are significant impacts from woodpeckers. Based on review of industry literature, discussion with those who have experience using composite poles, and first-hand observation, the advantages and disadvantages of composite poles (as compared to wood poles) are set forth below:

Benefits of Composite Poles:

- Lightweight
- Non-Conductive; Critical Flashover voltage ("CFO") is 150 kV per foot
- Ideal for remote and limited access area installations, especially carry-in locations
- No periodic treatments required
- Non-toxic disposal
- Pest and woodpecker resistant
- Corrosion and weather resistant
- Long service life - warranted for 40 years

Disadvantages of Composite Poles:

- Special hardware needed to climb
- Special handling and transportation requirements to prevent scarring that can result in failure
- Special tools and equipment needed to drill
- Special provisions needed to mount equipment
- Uncertain of performance with equipment mounted on pole
- Bushing tube inserts are required in all holes to protect the pole wall from localized stresses
- Expensive: anywhere from 8 to 9 times the cost of wood

- No taper to support equipment mounting hardware such as cluster-mount brackets
- Uncertain availability in the event of a major storm (Katrina required 19,200 poles in 3 days)
- Limited experience at most utilities; rarely used, typically for "carry-in" locations and woodpecker mitigation
- No arc quenching properties to aid in lightning mitigation
- No test results available on aged composite poles

Benefits of Wood Poles:

- Cost less than alternatives
- Improve lightning withstand capabilities through CFO of 100 kV per foot and arc-quenching properties
- Drilled/framed with standard tools
- Climbed with standard tools/equipment
- Availability, especially after major storm events
- Long service life - warranted up to 50 years
- Come in unlimited sizes and classes for use in every situation
- Present disposal method is solid landfill in most areas.
- Replenishable natural resource

Disadvantages of Wood Poles:

- Require special equipment to install in limited access areas (alley buggies already in use at Entergy)
- Require inspection and maintenance
- Are susceptible to decay and attack by insects and woodpeckers
- Future disposal requirements uncertain for some treatments
- Fire susceptibility of some treatments

In summary, ENO recognizes that certain members of the Council have expressed an interest in determining whether there might be benefits to extensive use of composite poles in the New Orleans service area, and ENO is also very interested in determining this. ENO intends, in the course of this storm hardening initiative, to look for locations where composite poles can be used and tested. It is important that, prior to any widespread implementation of composite poles in New Orleans, ENO gains experience with the poles to help ensure that they are compatible with our operating environment. Thus, prior to implementing any widespread use of composite poles in Orleans Parish, ENO expects to come back to the Council with additional information based on its experience in using and testing these poles.

VII. Possibilities for an Extended Long-Range Storm Hardening Plan

As noted briefly above, ENO has looked to the historical storm hardening strategies and accomplishments of FP&L as a possible model for the development of its current Storm Hardening Plan. FP&L is widely considered to be an industry leader in system hardening, and their service territory experiences many of the same weather challenges as ENO.

FP&L began major efforts to harden their system in 2006, after the extremely active tropical storm seasons of 2004 and 2005. As they have continued to develop and execute their hardening strategies, the scope and level of investment has increased to support a comprehensive approach with the goal of eventually achieving a completely hardened electrical system throughout their service territory. In their latest proposed hardening plan filed with the Florida Public Service Commission, FP&L is proposing to spend an estimated $1.6 billion over the next three years to strengthen up to approximately 700 backbone feeder circuits and nearly 1,000 lateral circuits, using the same basic prioritization approach as ENO, *i.e.*, targeting circuits serving critical customers.

While ENO feels that its plan for spending the requested $30.1 million in 2017 and 2018 will provide benefits of improved reliability in storm conditions and in day-to-day operations, it is clear from FP&L's current plan and past accomplishments that in order to achieve comprehensive hardening of ENO's electric distribution system, it will require investment on a much larger scale over a longer period of time. It will also require additional resources, whether ENO employees, contractors, or consultants, to develop and execute such a strategy. ENO will also need continued support, input and guidance from its regulators, as FP&L has received over the past decade, to move forward with developing a comprehensive, long-term strategy for hardening and enhancing the resiliency of the ENO electric facilities and timely and appropriate cost recovery for same. Accordingly, ENO suggests that if the Council approves its proposed Storm Hardening initiatives, that ENO provide periodic updates on the progress and hold technical conferences with the Council Advisors to consider the implementation of a long-term storm hardening program beyond 2018. ENO also believes that, given the highly technical and labor intensive nature of preparing such a program, it is appropriate to consider retaining a consulting firm with extensive storm hardening experience to assist in the preparation of any long-term storm hardening program.

VIII. Advanced Metering Infrastructure

ENO would like to note that in October 2016, it intends to file an Application with the Council seeking approval of an Advanced Metering Infrastructure program that will provide additional system reliability and resiliency benefits in the years to come, that will complement the storm hardening initiatives proposed herein, that will enable future system improvements, and that will help ENO better serve its customers via a modern, technologically advanced electric grid.

IX. Conclusion

ENO wholeheartedly shares the Council's desire to provide a cost-effectively storm hardened electrical system to serve ENO customers. Accordingly, ENO respectfully requests that the Council accept this Supplement to its Final Storm Hardening Report and the conclusions and recommendations contained herein in response to the requirements of Council Resolution R-15-31 and as support for the Company's response to the Show Cause Resolution and that the Council approve ENO's proposed Storm Hardening Plan.

Respectfully Submitted:

By: ______________________________

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CERTIFICATE OF SERVICE

I hereby certify that I have this 29th day of September, 2016, served the required number of copies of the foregoing pleading upon all known parties of this proceeding, by: ☒ electronic mail, ☐ facsimile, ☐ overnight mail, ☐ hand delivery, and/or ☒ United States Postal Service, postage prepaid.

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New Orleans, Louisiana, this 29th day of September, 2016.

ENO Eastbank Storm Hardening Plan

	2017	2018	Total
ENO O&M			
Enhanced Pole Inspections/Excavation	$ 102,892	$ 102,892	$ 205,784
Pole Replacements	$ 814,200	$ 814,200	$ 1,628,400
Circuit Reconfiguration	$ 92,000	$ 184,000	$ 276,000
Sectionalize and Automate Grid	$ 482,520	$ 482,520	$ 965,040
Targeted Hardening Work	$ 825,720	$ 959,720	$ 1,785,440
Subtotal O&M	**$ 2,317,332**	**$ 2,543,332**	**$ 4,860,664**

	2017	2018	Total
ENO Capital			
Enhanced Pole Inspections/Excavation	$ 700,643	$ 700,643	$ 1,401,286
Pole Replacements	$ 2,796,840	$ 2,796,840	$ 5,593,680
Circuit Reconfiguration	$ 368,000	$ 736,000	$ 1,104,000
Sectionalize and Automate Grid	$ 1,930,200	$ 1,930,200	$ 3,860,400
Targeted Hardening Work	$ 3,302,760	$ 3,838,760	$ 7,141,520
Subtotal Capital	**$ 9,098,443**	**$ 10,002,443**	**$ 19,100,886**
Total ENO	$ 11,415,775	$ 12,545,775	$ 23,961,550

ENO Algiers Storm Hardening Plan

	2017	2018	Total
Algiers O&M			
Enhanced Pole Inspections/Excavation	$ 19,320	$ 19,320	$ 38,640
Pole Replacements	$ 178,920	$ 218,680	$ 397,600
Circuit Reconfiguration	$ 144,000	$ 176,000	$ 320,000
Sectionalize and Automate Grid	$ 41,200	$ 41,200	$ 82,400
Misc. Reliability Work	$ 147,200	$ 220,800	$ 368,000
Subtotal O&M	**$ 530,640**	**$ 676,000**	**$ 1,206,640**

	2017	2018	Total
Algiers Capital			
Enhanced Pole Inspections/Excavation	$ 131,560	$ 131,560	$ 263,120
Pole Replacements	$715,320	$873,720	$1,589,040
Circuit Reconfiguration	$ 573,750	$ 701,250	$ 1,275,000
Sectionalize and Automate Grid	$ 166,400	$ 166,400	$ 332,800
Targeted Hardening Work	$588,800	$883,200	$1,472,000
Subtotal Capital	**$ 2,175,830**	**$ 2,756,130**	**$ 4,931,960**
Total Algiers	$ 2,706,470	$ 3,432,130	$ 6,138,600

List of ENO Feeders
By Priority Customers

Network	Substation	Feeder	Feeder Customer Count	# of Priority 0 Customers	# of Priority 1 Customers	# of Priority 2 Customers	# of Priority 3 Customers	# of Priority 4 Customers	Total # of Critical Customers
Tulane	JOLIET	2022	1,459	2	0	0	1	0	3
Tulane	AVENUE C	407	1,110	2	0	0	0	0	2
Tulane	DERBIGNY	1504	35	1	2	0	0	0	3
Tulane	MIDTOWN	907	2,580	1	1	0	1	0	3
NOE	PATERSON	1002	315	1	0	0	5	3	9
Tulane	MIDTOWN	911	1,538	1	0	0	2	0	3
NOE	PONTCHARTRAIN PARK	510	991	1	0	0	1	0	2
Tulane	DERBIGNY	1553	2,991	1	0	0	1	0	2
NOE	GULF OUTLET	1205	2,236	1	0	0	0	0	1
Tulane	JOLIET	2024	555	1	0	0	0	0	1
Tulane	AVENUE C	405	544	1	0	0	0	0	1
Tulane	AVENUE C	400	319	1	0	0	0	0	1
Tulane	AVENUE C	412	134	1	0	0	0	0	1
Tulane	JOLIET	2012	2,424	0	2	1	1	0	4
Tulane	AVENUE C	413	828	0	2	0	1	0	3
Tulane	MARKET ST	2147	2,661	0	2	0	0	1	3
Tulane	MARKET ST	2135	3,027	0	2	0	0	0	2
Tulane	DERBIGNY	1543	37	0	2	0	0	0	2
Algiers	HOLIDAY	W0715	3,780	0	1	5	5	22	33
Tulane	DERBIGNY	1512	299	0	1	3	0	0	4
Algiers	LOWER COAST	W1715	1,429	0	1	1	4	6	12
Tulane	NAPOLEON	1922	1,125	0	1	1	0	0	2
Tulane	DERBIGNY	1541	13	0	1	1	0	0	2
Algiers	LOWER COAST	W1714	2,737	0	1	0	6	2	9
NOE	CURRAN	2212	2,834	0	1	0	2	0	3
NOE	CURRAN	2217	1,375	0	1	0	2	0	3
Algiers	GRETNA	W0118	1,814	0	1	0	1	8	10
Tulane	PAUGER	1703	2,146	0	1	0	1	1	3
NOE	ALMONASTER	612	109	0	1	0	1	1	3
NOE	GULF OUTLET	1204	702	0	1	0	1	1	3
Tulane	SOUTHPORT	B0526	754	0	1	0	1	0	2

**List of ENO Feeders
By Priority Customers**

Network	Substation	Feeder	Feeder Customer Count	# of Priority 0 Customers	# of Priority 1 Customers	# of Priority 2 Customers	# of Priority 3 Customers	# of Priority 4 Customers	Total # of Critical Customers
Tulane	NAPOLEON	1923	1,961	0	1	0	1	0	2
Tulane	PAUGER	1712	1,169	0	1	0	1	0	2
Tulane	NAPOLEON	1917	1,785	0	1	0	1	0	2
Tulane	NAPOLEON	1927	1,280	0	1	0	0	1	2
NOE	SHERWOOD FOREST	1613	434	0	1	0	0	0	1
Tulane	PAUGER	1705	4,060	0	1	0	0	0	1
Tulane	PAUGER	1709	2,128	0	1	0	0	0	1
Tulane	PAUGER	1704	1,618	0	1	0	0	0	1
Tulane	DERBIGNY	1511	15	0	1	0	0	0	1
NOE	SHERWOOD FOREST	1608	79	0	1	0	0	0	1
Tulane	JOLIET	2011	2,101	0	1	0	0	0	1
Tulane	MIDTOWN	912	839	0	1	0	0	0	1
Tulane	JOLIET	2015	1,652	0	1	0	0	0	1
Tulane	AVENUE C	402	482	0	1	0	0	0	1
NOE	TRICOU	2344	1	0	1	0	0	0	1
NOE	ALMONASTER	624	1	0	1	0	0	0	1
Tulane	NAPOLEON	1924	2,651	0	1	0	0	0	1
Tulane	NAPOLEON	1926	980	0	1	0	0	0	1
NOE	GULF OUTLET	1202	91	0	1	0	0	0	1
Algiers	GRETNA	W0113	2,805	0	0	6	0	4	10
Tulane	JOLIET	2025	376	0	0	4	0	0	4
NOE	ALMONASTER	611	2,092	0	0	3	1	1	5
Algiers	LOWER COAST	W1725	2,656	0	0	3	0	10	13
NOE	PONTCHARTRAIN PARK	508	500	0	0	2	3	1	6
NOE	GULF OUTLET	1203	60	0	0	2	0	0	2
Tulane	DERBIGNY	1554	1,433	0	0	2	0	0	2
NOE	TRICOU	2345	601	0	0	1	4	2	7
NOE	PATERSON	1010	1,240	0	0	1	3	2	6
NOE	SHERWOOD FOREST	1607	1,939	0	0	1	3	1	5
NOE	SHERWOOD FOREST	1601	1,295	0	0	1	3	0	4
NOE	TRICOU	2346	2,117	0	0	1	2	0	3

List of ENO Feeders
By Priority Customers

Network	Substation	Feeder	Feeder Customer Count	# of Priority 0 Customers	# of Priority 1 Customers	# of Priority 2 Customers	# of Priority 3 Customers	# of Priority 4 Customers	Total # of Critical Customers
Tulane	DERBIGNY	1513	1,976	0	0	1	1	0	2
NOE	ALMONASTER	621	1,035	0	0	1	0	1	2
Tulane	MARKET ST	2137	1,688	0	0	1	0	0	1
Tulane	DERBIGNY	1506	21	0	0	1	0	0	1
Tulane	PAUGER	1708	1,017	0	0	1	0	0	1
Algiers	HOLIDAY	W0725	2,415	0	0	0	5	22	27
Algiers	LOWER COAST	W1712	3,130	0	0	0	4	13	17
Algiers	LOWER COAST	W1726	3,018	0	0	0	3	8	11
NOE	ALMONASTER	625	330	0	0	0	3	1	4
NOE	SHERWOOD FOREST	1612	732	0	0	0	3	0	3
NOE	CURRAN	2213	498	0	0	0	3	0	3
Algiers	LOWER COAST	W1713	2,414	0	0	0	2	7	9
Algiers	HOLIDAY	W0713	2,074	0	0	0	2	3	5
NOE	SHERWOOD FOREST	1605	1,215	0	0	0	2	0	2
Algiers	HOLIDAY	W0714	705	0	0	0	1	2	3
Algiers	BEHRMAN	W0524	537	0	0	0	1	2	3
NOE	ALMONASTER	622	1,579	0	0	0	1	1	2
Algiers	GRETNA	W0112	1,158	0	0	0	1	1	2
NOE	ALMONASTER	626	729	0	0	0	1	1	2
NOE	PONTCHARTRAIN PARK	501	649	0	0	0	1	1	2
Algiers	HOLIDAY	W0722	1,702	0	0	0	1	1	2
NOE	SHERWOOD FOREST	1603	158	0	0	0	1	0	1
Tulane	SOUTHPORT	B0527	2,323	0	0	0	1	0	1
Tulane	AVENUE C	409	1,547	0	0	0	1	0	1
Tulane	AVENUE C	410	1,063	0	0	0	1	0	1
Algiers	BEHRMAN	W0512	2,426	0	0	0	1	0	1
NOE	PATERSON	1001	813	0	0	0	1	0	1
NOE	SHERWOOD FOREST	1602	812	0	0	0	1	0	1
NOE	CURRAN	2215	3,174	0	0	0	1	0	1
NOE	ALMONASTER	614	2,357	0	0	0	1	0	1
Tulane	JOLIET	2016	2,138	0	0	0	1	0	1

List of ENO Feeders
By Priority Customers

Network	Substation	Feeder	Feeder Customer Count	# of Priority 0 Customers	# of Priority 1 Customers	# of Priority 2 Customers	# of Priority 3 Customers	# of Priority 4 Customers	Total # of Critical Customers
NOE	TRICOU	2347	2,042	0	0	0	1	0	1
NOE	ALMONASTER	627	1,852	0	0	0	1	0	1
Algiers	BEHRMAN	W0515	2,348	0	0	0	0	10	10
Algiers	HOLIDAY	W0712	1,222	0	0	0	0	9	9
Algiers	HOLIDAY	W0726	854	0	0	0	0	8	8
Algiers	GRETNA	W0115	2,688	0	0	0	0	4	4
Algiers	HOLIDAY	W0723	1,025	0	0	0	0	3	3
NOE	ALMONASTER	616	173	0	0	0	0	2	2
NOE	PONTCHARTRAIN PARK	513	70	0	0	0	0	1	1
Tulane	NAPOLEON	1911	751	0	0	0	0	1	1
NOE	PONTCHARTRAIN PARK	507	9	0	0	0	0	1	1
NOE	ALMONASTER	617	734	0	0	0	0	1	1
Tulane	MARKET ST	2132	2,505	0	0	0	0	0	0
Tulane	JOLIET	2014	2,308	0	0	0	0	0	0
NOE	SHERWOOD FOREST	1611	1,062	0	0	0	0	0	0
NOE	TRICOU	2325	586	0	0	0	0	0	0
Tulane	JOLIET	2026	2,627	0	0	0	0	0	0
Tulane	MARKET ST	2146	1,874	0	0	0	0	0	0
Tulane	MARKET ST	2142	1,249	0	0	0	0	0	0
Tulane	AVENUE C	411	935	0	0	0	0	0	0
Tulane	DERBIGNY	1510	23	0	0	0	0	0	0
Tulane	AVENUE C	408	851	0	0	0	0	0	0
Tulane	JOLIET	2017	1,666	0	0	0	0	0	0
NOE	TRICOU	2326	32	0	0	0	0	0	0
Tulane	MIDTOWN	910	1	0	0	0	0	0	0
Tulane	MIDTOWN	908	1	0	0	0	0	0	0
Tulane	MIDTOWN	906	1	0	0	0	0	0	0
Tulane	AVENUE C	406	758	0	0	0	0	0	0
NOE	CURRAN	2214	2,496	0	0	0	0	0	0
Algiers	BEHRMAN	W0525	2,226	0	0	0	0	0	0
Algiers	BEHRMAN	W0522	2,100	0	0	0	0	0	0

List of ENO Feeders
By Priority Customers

Network	Substation	Feeder	Feeder Customer Count	# of Priority 0 Customers	# of Priority 1 Customers	# of Priority 2 Customers	# of Priority 3 Customers	# of Priority 4 Customers	Total # of Critical Customers
Algiers	BEHRMAN	W0532	1,968	0	0	0	0	0	0
Algiers	BEHRMAN	W0533	1,874	0	0	0	0	0	0
Algiers	GRETNA	W0122	1,874	0	0	0	0	0	0
Algiers	BEHRMAN	W0514	1,835	0	0	0	0	0	0
Tulane	NAPOLEON	1913	1,660	0	0	0	0	0	0
NOE	CURRAN	2216	1,658	0	0	0	0	0	0
NOE	CURRAN	2211	1,629	0	0	0	0	0	0
Algiers	BEHRMAN	W0526	1,535	0	0	0	0	0	0
NOE	PONTCHARTRAIN PARK	503	1,350	0	0	0	0	0	0
Algiers	GRETNA	W0123	1,196	0	0	0	0	0	0
NOE	CURRAN	2223	1,185	0	0	0	0	0	0
NOE	SHERWOOD FOREST	1610	1,081	0	0	0	0	0	0
NOE	PONTCHARTRAIN PARK	512	974	0	0	0	0	0	0
Algiers	GRETNA	W0124	775	0	0	0	0	0	0
Tulane	AVENUE C	403	695	0	0	0	0	0	0
NOE	PONTCHARTRAIN PARK	502	632	0	0	0	0	0	0
Tulane	AVENUE C	401	575	0	0	0	0	0	0
Algiers	GRETNA	W0125	567	0	0	0	0	0	0
NOE	PONTCHARTRAIN PARK	509	562	0	0	0	0	0	0
Algiers	GRETNA	W0119	518	0	0	0	0	0	0
Algiers	GRETNA	W0114	283	0	0	0	0	0	0
Tulane	SOUTHPORT	B0525	186	0	0	0	0	0	0
Tulane	PAUGER	1701	77	0	0	0	0	0	0
Tulane	PAUGER	1713	69	0	0	0	0	0	0
Tulane	MIDTOWN	902	40	0	0	0	0	0	0
Tulane	JOLIET	2021	34	0	0	0	0	0	0

Total Customers 190,676

Design 2016 Incremental Reliability Execution Plan

- **Inspection Batch Numbers**
  - Tulane Network – WR#659863
  - NOE Network – WR#659864
- **Overhead Infrastructure Replacement (NO East / Tulane)**
  - Circuits prioritized by feeder exposure & past reliability performance (FOCUS)
  - Address infrastructure needs & improve BIL
    - Backbone Inspection entails:
      - Replace failed wooden cross arms with fiberglass
      - Replace failed or damaged insulators
      - Replace Poles identified during inspection or OSMOSE/JU backlog
      - Improve BIL (hendrix, conductor spacing, etc.)
      - Reference Backbone Inspection Form
      - WR per backbone
    - FOCUS Inspection entails Backbone Inspection and:
      - Sectionalization Opportunities
      - Positioning of Fuse Switches
      - Reference FOCUS Inspection Form
      - Capture Vegetation Issues
      - WR per FOCUS device
    - Pole Replacement (OSMOSE/ JOINT USE):
      - Cross reference backlog with circuit priority list
      - NJUNS should be completed
      - Engineering will investigate opportunities to install composite poles
      - WR per pole replacement
    - Install Fuse Arounds – 1 WR
    - Install Fault Indicators – 1 WR
- **Underground Infrastructure Replacement (NO East / CBD)**
    - Switching Cabinets (SM-4)
    - Replace G&W ATS
    - I-10 Service Road (Replace switchgear 2 singles to 4 way)
    - Wright Road (Replace switchgear 2 singles to 4 way)
    - Versailles Gardens
    - 1 Work Request per project

- Design Packet to include applicable information:
    - Feeder Map
    - Inspection Notes
    - Construction tracking sheet
    - Etc.
- **Tracking**
    - Metro Design to document Work Requests as they are created

Point #	Picture #	Pole Type F=Feeder L=Lateral S=Secondary	Bad Equip Qty &Type Fdr Arm, Lat Arm, Sec Arm, Pole		Structure Type T=Tangent DE=Dead End DDE=Double Dead End CC=Corner Const	# of phases	Wire Type/ Size	Feeder #	Need Hendrix Y/N	Priority P1 P2 P3	DLOC	Address	Inspected by: ____________________ Notes	Construction Completion Date	Completed By: (Company & Crew Lead)

Point #	Picture #	Pole Type F=Feeder L=Lateral S=Secondary	Bad Equip Qty &Type Fdr Arm, Lat Arm, Sec Arm, Pole		Structure Type T=Tangent DE=Dead End DDE=Double Dead End CC=Corner Const	# of phases	Wire Type/ Size	Feeder #	Need Hendrix Y/N	Priority P1 P2 P3	DLOC	Address	Inspected by: ____ Notes
1	1	L	2	L	T	2	C6	1705	Y	P1	39748478843	2624 Lepage	bad lateral arms, relocate xfmr switches
1	1	S	2	S	DE		2C	1705	Y	P1			bad wilson rack, 4 services
2	2,3	F	2	F	T	3	A336	1705	N	P1	40330486412	3916 Elysian Fields	bad fdr doubles
2	2,3	F	2	L	T	2	C6	1705	N	P1			bad lat doubles, relocate xfmr switches
3	4	L	1	P - AT&T	T	1	C6	1705	Y	P1	40068487519	416 Warrington	rotten bell pole, rotten lat arms, relocate xfmr switches, rotten sec arm
4	5	L	1	P	DE	2	C6	1705	Y	P1	39437478935	3343 St Philip	rotten 40' pole, DE lat, wilson rack 2 serv
5	6	F	2	F	T	3	C40	1705	Y	P2	3947448647	3225 St Philip	bad fdr doubles
5	6	F	2	S	T		2C	1705	Y	P2			bad wilson rack, 2 services
6	7	L	2	L	T	1	C2	1705	Y	P1	4009948718	322 Warrington	bad lat doubles
7	8	F	3	F	T	3	A336	705/62	Y	P2	40286482799	2971 Touro	double circuit, rotten fdr arms, relocate xfmr switches