Entergy

Entergy Services, LLC
639 Loyola Avenue (70113)
P.O. Box 61000
New Orleans, LA 70161-1000
Tel 504 576 6571
Fax 504 576 5579

Timothy S. Cragin
Assistant General Counsel
Legal Services - Regulatory

January 10, 2019

By Hand Delivery
Ms. Lora W. Johnson, CMC, LMMC
Clerk of Council
City Hall - Room 1E09
1300 Perdido Street
New Orleans, LA 70112

Re: Resolution Directing Entergy New Orleans, Inc. to Investigate and Remediate Electric Service Disruptions and Complaints and to Establish Minimum Electric Reliability Performance Standards and Financial Penalty Mechanisms – CNO Docket No. UD-17-04

Dear Ms. Johnson:

Please find enclosed for your further handling an original and three copies of Entergy New Orleans, LLC.'s ("ENO") Response to Prudence Investigation pursuant to Council Resolution R-18-475 containing the Supplemental Direct Testimony of Tad S. Patella, P.E. and the Direct Testimony of William L. Sones. 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

Timothy S. Cragin

TSC\rdm

Enclosures

cc: Official Service List (UD-17-04 *via electronic mail*)

RECEIVED
JAN 10 2019
BY:

JAN 04 34

BEFORE THE

COUNCIL OF THE CITY OF NEW ORLEANS

RESOLUTION DIRECTING ENTERGY NEW ORLEANS, INC. TO INVESTIGATE AND REMEDIATE ELECTRIC SERVICE DISRUPTIONS AND COMPLAINTS AND TO ESTABLISH MINIMUM ELECTRIC RELIABILITY PERFORMANCE STANDARDS AND FINANCIAL PENALTY MECHANISMS	)	**DOCKET NO. UD-17-04**

ENTERGY NEW ORLEANS, LLC'S RESPONSE PRUDENCE INVESTIGATON SUBMITTED PURSUANT TO COUNCIL RESOLUTION R-18-475

Entergy New Orleans, LLC ("ENO" or the "Company") respectfully submits this response to the prudence investigation set forth in the Council of the City of New Orleans' (the "Council's") Resolution R-18-475 (the "Prudence Resolution") adopted on October 31, 2018. Resolution R-18-475 directs ENO to file with the Council by January 10, 2019, "such testimony, evaluations, analyses, workpapers, and other information as the Company believes will be of assistance to the Council in this prudence investigation." Accordingly, attached to this response is the Direct Testimony of William L. Sones, Director of Grid Operations for Louisiana, and the Supplemental Direct Testimony of Tad S. Patella, Senior Manager, New Orleans Metro Region Customer Service. Mr. Sones' testimony discusses transmission reliability actions and Mr. Patella's testimony updates his previous Direct Testimony submitted in June 2018 in response to the Council's April 2018 Resolution R-18-98 (the "Show Cause Resolution").

In addition, to the testimonies of Mr. Sones and Mr. Patella, submitted herewith, ENO requests that the Council take into consideration the following additional filings that have been submitted over the course of this docket (as these have already been filed in this docket, ENO is not resubmitting them with this filing):

1) ENO's original Reliability Plan, filed on November 10, 2017;

2) ENO's Response to the Show Cause Resolution, filed on June 6, 2018, including the Direct Testimony and Exhibit of Melonie P. Stewart and the Direct Testimony and Exhibits of Tad S. Patella;

3) ENO's Revised Reliability Plan, with Exhibits, filed on July 5, 2018;

4) The Quanta Technology, LLC's Assessment of ENO's Distribution Reliability Improvement Initiatives, filed on October 31, 2018;

5) ENO's Reliability Progress Report as of October 31, 2018, filed on November 30, 2018;

6) ENO's Response to Comments of the Intervenors and the Council Advisors on the Quanta Technology Report, filed on December 27, 2018.

Additionally, ENO asks the Council to take into consideration its 2019 Reliability Plan that it is in the process of finalizing and that will be filed with the Council on January 18, 2019.

I. BACKGROUND

This Council Docket UD-17-04, entitled "Resolution Directing Entergy New Orleans, Inc. to Investigate and Remediate Electric Service Disruptions and Complaints and to Establish Minimum Electric Reliability Performance Standards and Financial Penalty Mechanisms," was initiated on August 10, 2017, pursuant to Council Resolution R-17-427. Resolution R-17-427 expressed the Council's concerns about the level of recent distribution reliability issues in New Orleans and indicated that it was opening this docket "to consider the establishment of minimum reliability standards for all of the utilities under the Council's jurisdiction including the establishment of financial penalty mechanisms for failure to meet such minimum reliability performance standards *as established by the Council in this docket*." (Emphasis added.)

Resolution R-17-427 referenced the Louisiana Public Service Commission's ("LPSC") General Order of April 30, 1998 in LPSC Docket No. U-22389 that required all utilities under the LPSC's

regulatory jurisdiction to design and maintain a program to improve the reliability of electric distribution systems to within an initial minimum performance standard consisting of an annual maximum System Average Interruption Frequency Index ("SAIFI") of 2.84 and an annual maximum System Average Interruption Duration Index ("SAIDI") of 3.58 hours, or approximately 215 minutes. Under that General Order, the minimum SAIFI and SAIDI standards remained static for the first 2 years after adoption of the Order, and then became more stringent by an additional 5% per year, such that by the 7th year after adoption of the Order (i.e., 2004), the SAIFI minimum standard was 2.28 and the SAIDI minimum standard was 2.87 hours or approximately 172 minutes. The minimum standards that the LPSC had in place as of 2004 (i.e., SAIFI of 2.28 and SAIDI of 2.87 hours, or 172 minutes) remain in place today. Those standards have not changed since that time. Additionally, it is important to note that the LPSC applies these standards to each utility's SAIFI and SAIDI performance as a whole, rather than on a feeder-by-feeder basis.[1]

Pursuant to Resolution R-17-427, on or about September 11, 2017,[2] the Council Advisors filed their Initial Report to the Council containing the Technical Advisors' Review of ENO's Outages and Reliability Performance ("Technical Advisors Report"). The last paragraph at page 7 of that Report states the following:

> As required by Resolution R-17-427, upon receipt of ENO's recommended SAIFI and SAIDI reliability standards, the Technical Advisors will evaluate ENO's proposed reliability standards in conjunction with reliability standards which have been adopted by other retail regulatory commissions throughout the country and provide their recommendations for the establishment of specific minimum reliability standards for the Council's consideration.

[1] It should be noted, however, that the LPSC's Regulations do require each utility to analyze, at a minimum, it top 5% worst performing circuits and to report on actions taken to improve the performance of those circuits on an annual basis.

[2] The Advisors filed a "Corrected Report" on October 31, 2017, to make minor typographical corrections to the originally-filed report.

Pursuant to Resolution R-17-427, on November 10, 2017, ENO filed its Reliability Plan with the Council. That Plan, as required by the Resolution, included discussion of ENO's recommended SAIFI and SAIDI goals, including the following:

> In considering the establishment of minimum SAIFI and SAIDI performance measures, it is important for the Council to consider the nature of ENO's urban service territory. For example, with regard to SAIDI, which is a measure of average outage duration, it is important to consider that the time it takes to resolve an outage includes all of the following actions: (1) mobilization to the area where the outage is occurring; (2) feeder inspection to identify any damage and root cause; (3) working with the Distribution Operations Center ("DOC") to perform any available field switching to isolate the feeder damage and to restore as many customer outages as possible; (4) safely navigating any traffic congestion and/or job site challenges; (5) following safety protocol to develop the plan to make repairs (Job Hazard Analysis and Scope of Work); (6) retrieval of any equipment and/or material if not already on site (*e.g.*, a new pole); (7) the act of safely making the necessary repairs; (8) following safety protocol to work with DOC to release any Clearances/Grounds; and finally, (9) working with DOC to carry out switching orders to restore feeder to normal configuration, which may involve multiple crews navigating to and setting up at different switches from where the repairs were made. Operating in congested city conditions can adversely impact the time that it takes to carry out these restorative activities.
>
> ….
>
> At this time, ENO suggests that a distribution line SAIFI goal for 2018 of 1.587 and a distribution line SAIDI goal of 175.7 would be reasonable, based on historical SAIFI and SAIDI performance and the estimated impact of the reliability improvement programs described elsewhere in this document. The SAIDI goal incorporates the impact of traffic congestion and job site access challenges in ENO's urban service territory as discussed. ENO emphasizes that these are goals and that any minimum standards should be higher than these proposed goals. ENO suggests, however, that a technical conference be held prior to the Council imposing any minimum standard to have a candid discussion with stakeholders about the challenges and tradeoffs related to maintaining a reliable distribution system and to ensure that all parties understand the inherent limitations of SAIFI and SAIDI measures and the various issues that can cause a utility to experience periodic aberrations or abnormal temporary fluctuations in these measures. ENO further suggests that any Council imposition of SAIFI and SAIDI standards provide a process that allows for explanations of extraordinary circumstances that may adversely affect ENO's ability to achieve any standard imposed.

ENO Reliability Plan, at pp. 9-10.

Resolution R-17-427 further required that:

> By December 31, 2017, based upon the Technical Advisors' review of ENO's supplemental information, the Technical Advisors will file with the Council, … the results of its analysis of ENO outages and reliability performance, along with the Advisors' evaluation and recommendation of appropriate minimum reliability performance standards for ENO taking into consideration the urban nature of ENO's service territory within Orleans Parish, and recommending appropriate financial penalties for non-compliance for consideration by the Council.

Despite the requirements of the Council Resolution, the Council Advisors did not file an evaluation and recommendation of appropriate minimum reliability performance standards or financial penalties by December 31, 2017 and did not seek an extension of that filing requirement.

On April 5, 2018, the Council adopted Resolution R-18-98, which found ENO's previously-filed Reliability Plan to be lacking sufficient detail concerning ENO's proposed projects to allow a comprehensive review of the Plan, and the Resolution directed ENO to (1) show cause why its reliability performance should not be deemed imprudent; and (2) file a revised reliability plan with adequate detail regarding the reliability projects to allow comprehensive review. Resolution R-18-98 also directed the Council Advisors to file within 60 days of ENO's filing of a Revised Reliability Plan a report that, among other things, would recommend "proposed minimum reliability standards upon which ENO's reliability performance can be evaluated" and "proposed financial penalty mechanisms for ENO's non-compliance with such minimum reliability performance standards for the Council's consideration and future action."

Resolution R-18-98 also referenced certain Council Resolutions adopted in the 1998 (R-98-460) and 1999 (R-99-433) timeframe, during which time the Council required ENO to submit reliability remediation plans for its various distribution networks

in the City. Resolution R-99-433, adopted on July 15, 1999, accepted the remediation plans filed by ENO and stated that "ENO is hereby placed on notice that the Council shall, after ENO has had an opportunity to be heard" impose financial penalties on ENO if ENO's actual SAIFI for the period did not meet the SAIFI ENO proposed in its remediation plans and/or if ENO failed to complete the projects proposed in those plans. In the approximately twenty years that have passed since Resolution R-99-433 was adopted by the Council, ENO is aware of no instance in which the Council imposed any penalty on ENO for failure to meet the remediation plans it submitted nearly two decades ago or for failure to achieve any minimum reliability standard.

Pursuant to Resolution R-18-98, ENO filed its response to the Show Cause Resolution on June 6, 2018, and its Revised Reliability Plan on July 5, 2018. That Revised Reliability Plan stated that ENO was in the process of engaging an independent, national expert on distribution reliability to perform a review of ENO's reliability plan. ENO notified the Council Advisors in or about August 2018 that it had engaged Quanta Technology, LLC, national expert in distribution reliability, among other utility-related areas, to review its reliability plan and that it expected Quanta to issue a report by October 31, 2018. Accordingly, the parties agreed to suspend the procedural schedule until the Quanta report was filed with the Council and thereafter agreed to a procedural schedule, later adopted and ordered by Judge Jeffrey S. Gulin, that would provide for dates by which comments by the Intervenors and the Advisors and responsive comments by ENO would be filed with regard to the Quanta Report and with regard to ENO's 2018 Revised Reliability Plan and ENO's progress on that plan.

On October 31, 2018, the Council adopted Resolution R-18-475, which again reiterated "its intention to establish minimum reliability performance standards and financial penalty mechanisms" and required ENO to make a filing by January 10, 2018 including such testimony, evaluations, analyses, workpapers, and other information that ENO believes the Council should consider in determining if ENO should be deemed imprudent in addressing the performance of the distribution system and whether financial and/or other penalties should be imposed.

II. ARGUMENT

A. The Council Should Not Impose a Financial Penalty on ENO for Not Meeting a Minimum Reliability Standard When the Council Has Not Established Either a Minimum Reliability Standard or a Financial Penalty for Not Meeting Such a Standard

Council Resolution R-17-427, which initiated this docket on August 10, 2017, stated that one of the very purposes of this docket was "to consider the establishment of minimum reliability performance standards … including the establishment of financial penalty mechanisms for failure to meet such minimum reliability performance standards as established by the Council in this docket." That intention was reiterated in the September 2017 Technical Advisors' Report, in the April 2018 Resolution R-18-98, and most recently in the October 2018 Resolution R-18-475. Clearly, if the purpose of this docket was to establish minimum reliability standards and associated financial penalties for failure to meet such standards, no such standards were in place at the inception of this docket. Moreover, to date, no such minimum reliability performance standards or financial penalty mechanisms have been proposed by the Advisors or any other party to this docket and, accordingly, the Council has neither established nor considered the establishment of any such minimum reliability standards or associated financial penalties. Because the Council has not established minimum reliability standards or any penalties

associated with failure to meet any such standards if adopted, no financial penalty should be imposed on ENO retroactively for failing to meet some standard established after the fact.

There is a certain cost associated with attaining and maintaining a certain standard of reliability for a distribution system. The reasonable cost of attaining and maintaining reliability at a level equal to or better than a Council-imposed minimum reliability standard is recoverable from ENO's customers as a reasonable and necessary cost of providing safe, reliable electric service. However, in order to gauge the level of investments ENO must make and the level of costs it must expend to meet or exceed a Council-imposed minimum reliability standard, it must know what that standard is. If the Council expects 1st quartile performance, there will be a certain cost associated with achieving and maintaining that level of reliability. If the Council expects 2nd quartile performance, presumably there will be a somewhat lower level of cost associated with attaining and maintaining that level of reliability.

This is not to say that ENO, or any utility, can predict, with precision, the exact level of costs that it would take to reach a specific level of reliability, or a SAIFI of "X" and a SAIDI of "Y." Improving and maintaining reliability is as much art as it is science. But if the Council is going to seek to penalize ENO for not attaining a certain level of reliability, it should first enact the standards it plans to impose, so ENO can assess the level of financial commitment needed.

B. Louisiana Law Provides that ENO is Entitled to a Presumption of Prudence in the Investments It Makes and the Costs It Incurs

Council Resolution R-18-98 required ENO to show cause why it should not be "presumed imprudent." The answer to this is stated in well-settled Louisiana utility law.

The Louisiana Supreme Court has established that the utility is entitled to a presumption of prudence with respect to the costs that it incurs to provide utility service. In *Gulf States Utilities Company v. Louisiana Public Service Commission*, the Louisiana Supreme Court

announced for the first time that the Commission, when considering the prudence of a utility's decision to invest in a capital asset, had to accord the utility a presumption of prudence:

> Capital and other expenditures reflected in utilities' pro forma requests for rate increases are generally accepted by the Commission as appropriate and necessary, and therefore recoverable, expenses. In that sense, a utility's investments are presumed to be prudent and allowable. When, however, the Commission raises serious doubt about the prudence of a particular investment, a searching inquiry becomes necessary, and at that point, the burden shifts to the utility to prove that the expenditure was in fact necessary and appropriate, or resulted in no additional costs.[3]

In the following year, in *South Central Bell Telephone Company v. Louisiana Public Service Commission*, the Louisiana Supreme Court reiterated its previous holding that the prudent investment rule entitles a utility to a presumption of prudence, and also held that the prudent investment rule and the presumption of prudence are applicable to all costs incurred by a utility to provide utility service.[4]

Here, the Council's suggestion that there should be a presumption that ENO has been imprudent flies in the face of well-established Louisiana law. Through the testimony and other filings made in this docket, ENO has shown that it has reacted reasonably and prudently in the face of increased distribution-related outages in 2016 by significantly increasing its reliability-related investments and expenditures and by setting forth a detailed and reasonable plan for combating those increases. With respect to the increase in transmission/substation-related

---

[3] *Gulf States Utils. Co. v. Louisiana Pub. Serv. Comm'n*, 578 So. 2d 71 (La. 1991); see also, *South Cent. Bell Tel. Co. v. Louisiana Pub. Serv. Comm'n*, 594 So. 2d 357, 366 (La. 1992) (Dennis, J., writing for the majority) ("South Central Bell is entitled to be compensated for all prudent investments at their actual cost when made (their "historical" cost) irrespective of whether individual investments are deemed necessary or beneficial in hindsight and the utility is entitled to the presumption that the investments were prudent, unless the contrary is shown." (citations omitted)).

[4] *Id*. ("Because, as Justice Brandeis observed, there is no essential difference between a capital charge and an operating expense, as a cost of supplying the service that must be met from the revenue requirement, the Commission's failure to apply the [prudent investment] rule equally to both types of costs or investments was arbitrary and unjustified.")

outages in 2018, the Company has undertaken a number of actions laid out in the direct testimony of William L. Sones. Rather than a presumption of imprudence, which would be contrary to Louisiana law, ENO is entitled to a presumption of prudence, and based on the testimony, exhibits, and other filings in this docket, a determination that it has acted and is acting prudently in managing its distribution system and the reliability thereof.

C. ENO Has Acted Reasonably and Prudently in Managing System Reliability and Working to Remediate Customer Interruptions

As set forth in the attached Direct Testimony of William L. Sones and the Supplemental Direct Testimony of Tad S. Patella, and in the other filings ENO has made in this docket, including those referenced above, ENO has acted reasonably and prudently in managing the reliability of its energy delivery system, remediating disruptions and working diligently to combat the ravages of time and Mother Nature on its system infrastructure. ENO has invested well over $50 million in the last three years to address the more significant increase in outages and disruptions that began to be seen in 2016 and continued into recent years. Indeed, as discussed in the Direct Testimony of Mr. Patella, filed in June 2018, in 2016, beginning a year before the Council even initiated this docket, ENO ramped up its reliability spending by $10 million over its baseline reliability budget and committed to spending an additional $30 million on storm hardening projects. As discussed in Mr. Patella's Supplemental Direct Testimony, the distribution line reliability projects and storm hardening projects completed in recent years appear to be having a positive effect, with preliminary distribution line customer interruptions in 2018 declining by approximately 20% when compared to 2017 distribution line customer interruptions. Although these distribution line advances were offset in 2018 by a challenging year for transmission-related customer interruptions, it is clear that the hard work that is being done by our motivated reliability team is showing progress.

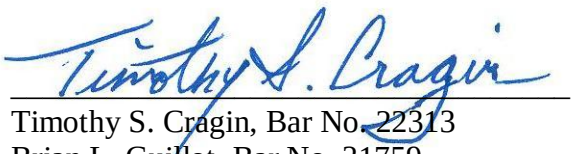
III. CONCLUSION

For ENO, the reliability equation involves assessing how to maintain and make incremental improvements to a legacy distribution system (and the transmission lines and substations necessary to get the electrons to the distribution system), while preparing to implement a significant and highly complex modernization and automation effort to that legacy distribution system. This reliability equation is further complicated by the fact that the distribution system at issue serves a hurricane-prone City built on a swamp that is surrounded by water on three sides and sits largely below sea level; where some 30% of residents live below the poverty line; and where the design and configuration of the system (when designed decades ago) was cost-effective and provided excellent reliability, but under today's circumstances (which include urban congestion, more customer demands and expectations for uninterrupted service, customer-sited generation, more extreme weather patterns, and now-aging infrastructure) present increasing challenges. While ENO has worked very hard in recent years to improve its distribution system reliability through its well-established and reasonable baseline reliability programs, it has become more and more apparent with technological advancements in recent years, that modernization and automation of the system is required if New Orleans is going to remain a vibrant and viable city well into the future. ENO, with reasonable regulation by the Council, is poised and highly motivated to embrace grid modernization and automation to deliver a more efficient and resilient distribution system that better serves its customers and the citizens of New Orleans.

For the reasons set forth herein, and in the testimonies of Messrs. Sones and Patella filed herewith, and in the various other filings in this docket, including, without limitation, those referenced herein, ENO urges the Council to find that it has acted reasonably and prudently in

managing the reliability of its distribution system (including the transmission lines and substations that deliver power to the distribution system.)

Respectfully Submitted:

By: 

Timothy S. Cragin, Bar No. 22313
Brian L. Guillot, Bar No. 31759
Harry M. Barton, Bar No. 29751
639 Loyola Avenue, Mail Unit L-ENT-26E
New Orleans, Louisiana 70113
Telephone: (504) 576-6571
Facsimile: (504) 576-5579

ATTORNEYS FOR ENTERGY NEW ORLEANS, LLC

CERTIFICATE OF SERVICE

Docket No. UD-17-04

I hereby certify that I have served the required number of copies of the foregoing report upon all other known parties of this proceeding, by the following: electronic mail, facsimile, overnight mail, hand delivery, and/or United States Postal Service, postage prepaid.

Ms. Lora W. Johnson, CMC, LMMC
Clerk of Council
Council of the City of New Orleans
City Hall, Room 1E09
1300 Perdido Street
New Orleans, LA 70112

Erin Spears, Chief of Staff
Connolly A. F. Reed
Council Utilities Regulatory Office
City of New Orleans
City Hall, Room 6E07
1300 Perdido Street
New Orleans, LA 70112

David Gavlinski
Council Chief of Staff
New Orleans City Council
City Hall, Room 1E06
1300 Perdido Street
New Orleans, LA 70112

Sunni LeBeouf
Bobbie Mason
City Attorney Office
City Hall, Room 5th Floor
1300 Perdido Street
New Orleans, LA 70112

Norman White
Department of Finance
City Hall, Room 3E06
1300 Perdido Street
New Orleans, LA 70112

Hon. Jeffery S. Gulin
3203 Bridle Ridge Lane
Lutherville, MD 21093

Andrew Tuozzolo
CM Moreno Chief of Staff
1300 Perdido Street, Room 2W40
New Orleans, LA 70112

Clinton A. Vince
Presley R. Reed, Jr.
Emma F. Hand
Herminia Gomez
Dentons US LLP
1900 K Street, NW
Washington, DC 20006

Basile J. Uddo
J.A. "Jay" Beatmann, Jr.
c/o Dentons US LLP
The Poydras Center
650 Poydras Street, Suite 2850
New Orleans, LA 70130-6132

Walter J. Wilkerson
Kelley Bazile
Wilkerson and Associates, PLC
The Poydras Center, Suite 1913
650 Poydras Street
New Orleans, LA 70130

Joseph W. Rogers
Philip J. Movish
Lauren Oliva
Legend Consulting Group
8055 East Tufts Avenue
Suite 1250
Denver, CO 80237-2835

Errol Smith
Bruno and Tervalon
4298 Elysian Fields Avenue
New Orleans, LA 70122

Gary E. Huntley
Vice President, Regulatory Affairs
Entergy New Orleans, LLC
1600 Perdido Street
Mail Unit L-MAG-505B
New Orleans, LA 70112

Polly S. Rosemond
Derek Mills
Seth Cureington
Entergy New Orleans, LLC
1600 Perdido Street
Mail Unit L-MAG-505B
New Orleans, LA 70112

Timothy S. Cragin
Brian L. Guillot
Alyssa Maurice-Anderson
Harry M. Barton
Entergy Services, LLC
639 Loyola Avenue
Mail Unit L-ENT-26E
New Orleans, LA 70113

Joseph J. Romano, III
Suzanne Fontan
Therese Perrault
Entergy Services, LLC
639 Loyola Avenue
Mail Unit L-ENT-4C
New Orleans, LA 70113

Emily K. Leitzinger
Mid-City Neighborhood Organization
4313 Palmyra Street
New Orleans, LA 70119

Logan Atkinson Burke
Forest Bradley-Wright
Sophie Zaken
Alliance for Affordable Energy
4505 S. Claiborne Avenue
New Orleans, LA 70125

Julianna D. Padgett
Carrollton Riverbend Neighborhood Assn.
935 Dante Street
New Orleans, LA 70118

Ian Dreyer
Parkview Neighborhood Association
872 Taft Place
New Orleans, LA 70119

Jacob Rickoll
Tulane Canal Neighborhood Association
2301 Conti Street
New Orleans, LA 70119

Abigail Sebton
Urban Conservancy Petition
1307 OC Haley Boulevard #307
New Orleans, LA 70113

Keith Hardie
Maple Area Residents, Inc.
618 Audubon Street
New Orleans, LA 70118

Monique Harden
Deep South Center for
Environmental Justice, Inc.
3157 Gentilly Boulevard, #145
New Orleans, LA 70122

Renate Heurich
350 Louisiana-New Orleans
1407 Napoleon Avenue, #B
New Orleans, LA 70115

Luke F. Piontek
Judith Sulzer
Roedel, Parsons, Koch, Blache, Balhoff
& McCollister
8440 Jefferson Highway
Suite 301
Baton Rouge, LA 70809

James E. Thompson, III
Sewerage and Water Board
625 St. Joseph Street, Room 201
New Orleans, LA 70165

Eric J. Songy
Algiers Neighborhood Presidents Council
P.O. Box 740446
New Orleans, LA 70174

Warrenetta C. Banks
Lower 9 Resilient
5130 Chartres Street
New Orleans, LA 70117-3808

Arthur J. Johnson
Lower 9th Ward Center for Sustainable
Engagement and Development
5227 Chartres Street
New Orleans, LA 70117

David Dalia
609 Dumaine Street
New Orleans, LA 70115-3210

Dawn Hebert
6846 Lake Willow Dr.
New Orleans, LA. 70126

Denise T. Turbinton
931 Mazant St.
New Orleans, LA 70117

New Orleans, Louisiana, this 10th day of January 2019.

Timothy S. Cragin

BEFORE THE

COUNCIL OF THE CITY OF NEW ORLEANS

RESOLUTION DIRECTING ENTERGY NEW ORLEANS, INC. TO INVESTIGATE AND REMEDIATE ELECTRIC SERVICE DISRUPTIONS AND COMPLAINTS AND TO ESTABLISH MINIMUM ELECTRIC RELIABILITY PERFORMANCE STANDARDS AND FINANCIAL PENALTY MECHANISMS	**)**	**DOCKET NO. UD-17-04**

SUPPLEMENTAL DIRECT TESTIMONY

OF

TAD S. PATELLA, P.E.

ON BEHALF OF

ENTERGY NEW ORLEANS, LLC

JANUARY 2019

TABLE OF CONTENTS

I. INTRODUCTION

Q1. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A. My name is Tad S. Patella. My business address is 3700 Tulane Avenue, New Orleans, LA 70119.

Q2. BY WHOM ARE YOU EMPLOYED AND IN WHAT CAPACITY?

A. I am currently employed by Entergy Services, LLC ("ESL")[1] as Senior Manager, Metro Region Customer Service for New Orleans, Louisiana.

Q3. ON WHOSE BEHALF ARE YOU TESTIFYING?

A. I am filing this Supplemental Direct Testimony before the Council of the City of New Orleans (the "Council") on behalf of Entergy New Orleans, LLC ("ENO" or the "Company").

Q4. DID YOU PREVIOUSLY FILE DIRECT TESTIMONY IN THIS DOCKET IN JUNE 2018?

A. Yes.

[1] ESL is a service company affiliate of Entergy New Orleans, LLC ("ENO," or the "Company") that provides general executive, management, advisory, administrative, human resources, accounting, finance, legal, regulatory, and engineering services. These services are provided in accordance with Service Agreements entered into by ESI and the Operating Companies, to which ESI provides services, and are approved by the Federal Energy Regulatory Commission. The Entergy Operating Companies include, in addition to ENO, Entergy Mississippi, LLC; Entergy Arkansas, LLC; Entergy Louisiana, LLC; and Entergy Texas, Inc.

Q5. WHAT IS THE PURPOSE OF YOUR SUPPLEMENTAL DIRECT TESTIMONY?

A. The purpose of this testimony is to support and supplement ENO's previous response to the show cause portion of Council Resolution R-18-98 and to support ENO's response to the prudence investigation set forth in Council Resolution R-18-475. This Supplemental Direct Testimony will address actions taken by ENO in 2018 to address distribution reliability, which actions are in addition to those discussed in my Direct Testimony. My Supplemental Direct Testimony, in conjunction with my Direct Testimony, the Direct Testimony of Melonie Stewart, and other filings previously submitted in this docket help to demonstrate that ENO's distribution reliability programs are reasonable and prudent and that the measures that it has taken to address recent reliability challenges have been reasonable and prudent.

Q6. WHAT SPECIFIC AREAS WILL YOU ADDRESS IN THIS TESTIMONY?

A. I would like to discuss the following specific areas: (1) our establishment in 2018 of a dedicated "Fix-It-Now" ("FIN") reliability crew and the success that the crew has had in identifying potential outages before they occur and fixing the issue(s) that might have resulted in an outage; (2) our engagement of Quanta Technology, LLC to perform an independent review of our reliability programs and to provide recommendations for improving our reliability programs and procedures; and (3) the reliability work that was accomplished in 2018 and the distribution line reliability improvements that we are seeing.

II. THE "FIX-IT-NOW" DISTRIBUTION RELIABILITY CREW

Q7. WHAT IS THE "FIX-IT-NOW" DISTRIBUTION RELIABILITY CREW AND WHY WAS IT ESTABLISHED?

A. During April of 2018, in addition to day-to-day reliability focus of both ENO and external contractor crews and ENO's primary reliability programs, ENO realigned certain personnel to establish a dedicated "Fix-It-Now" ("FIN") crew to focus on immediate reliability concerns. The FIN crew is composed of four distribution line mechanics previously assigned to individual ENO networks. By combining them into a dedicated crew covering all of ENO's distribution system, they can now resolve emergent high priority issues identified by other crews from across the City or identified by their own proactive inspections. The FIN crew is led by John Kingston, Line Supervisor for ENO's Metro Region, who has worked on distribution line reliability in the New Orleans area for 42 years.

The FIN crew's role is to identify distribution system situations that may not have been captured by ENO's FOCUS or Backbone reliability programs, but that indicate a reasonably high possibility of an imminent distribution outage. The FIN crew uses visual inspections, with the help of infrared equipment, to identify potential problems and/or "hot spots" that indicate imminent reliability vulnerabilities. When potential problems are identified, the FIN crew can either make the necessary repairs themselves or schedule another crew to do so in the near future to prevent the trouble area from leading to an outage and customer interruptions.

Q8. HAS ENO FOUND THE FIN CREW'S WORK TO BE EFFECTIVE IN PREVENTING CUSTOMER INTERRUPTIONS?

A. Yes. In 2018, ENO estimates that the work performed by this dedicated reliability crew has performed work preventing potential outages that it is estimated could have resulted in approximately 53,000 customer interruptions.[2] In addition to the work performed by the FIN crew, ENO estimates that an additional approximately 17,000 potential customer interruptions were avoided by identification of crossarm vulnerabilities by the network crews and working with the FIN crew to schedule repair of those compromised crossarms.

ENO is modifying its reliability program for 2019 to include an expanded scope of FIN crew inspections and corresponding repair work based on the success that we have experienced with this approach to date. This will be

[2] Customer Interruptions (also sometimes referred to in the industry as "customers interrupted") refers to the number of customers that experience a particular outage, or the aggregate number of customers that experienced service interruptions for a given set of outages. Thus, if 300 customers are affected by an outage, there would be 300 customer interruptions associated with that outage. If there were five such outages, with each outage affecting 300 customers (even if some individual customers experienced more than one of the outages), the total customer interruptions associated with those five outages would be 1,500. In estimating customer interruptions avoided by a particular action, ENO determines the number of customers that would have experienced an outage if the particular vulnerability had not been resolved. Although it is impossible to determine with precision when such a vulnerability will, in fact, occur (*e.g.*, when will a degraded crossarm or a cracked insulator ultimately cause an outage), the FIN crew focused on issues that represented the *potential* for imminent failure. However, the fact that the FIN crew estimates that its work helped avoid over 53,000 customer interruptions is not intended to suggest that all such customer interruptions would have occurred in 2018. It should be noted in ENO's Progress Report through October 31, 2018, ENO reported that the FIN crew had performed work that resulted in approximately 80,000 customer interruptions avoided through October. Since that report was filed, ENO has revised that count to attempt to exclude instances where work was performed in multiple locations behind a single device (e.g., if two vulnerabilities on the same feeder would each result in the same 500 customers experiencing an interruption, the revised count of avoided customer interruptions would be 500 rather than 1,000 even though the vulnerabilities, if not resolved, could have resulted in separate outages and thus, 1,000 customer interruptions).

discussed in more detail when ENO files its 2019 Reliability Plan on January 18, 2019.

III. ENGAGEMENT OF QUANTA TECHNOLOGY, LLC

Q9. WHY DID ENO DECIDE TO ENGAGE QUANTA TECHNOLOGY, LLC ("QUANTA")?

A. ENO's distribution reliability team is continuously looking for ways to improve distribution system reliability for ENO customers. They consult with peer utilities and participate in training sessions to gain knowledge of best practices for distribution reliability. However, with the uptick in outages seen in the 2016 and 2017 timeframe as compared to the prior three years, ENO felt it would be helpful to engage the services of national experts in reliability to review ENO's existing reliability programs and procedures and to provide feedback and recommendations on them with a view toward improved distribution system reliability. Accordingly, in August 2018, ENO completed negotiations with Quanta regarding such an engagement and Quanta began its work.

Q10. WHAT WAS THE NATURE OF QUANTA'S REVIEW?

A. Quanta conducted a review of ENO's distribution reliability programs and compared its distribution reliability practices with industry leading practices and those of a selected group of high-performing peer utilities. Quanta's review included a review of extensive information and documentation relating to ENO's distribution system, operations, and reliability; on-site interviews with ENO subject matter experts in

operations, reliability assessment, organizational performance analysis, asset management, and other related areas; a discussion with the Council's Legal and Technical Advisors regarding distribution system reliability and the planned scope of the work; a field patrol of portions of ENO's distribution system; and a survey and benchmarking analysis to compare ENO's reliability programs and its reliability metrics to other utilities that have exhibited strong reliability performance.

Q11. DID QUANTA PREPARE A REPORT BASED ON THEIR REVIEW?

A. Yes. Quanta prepared a report entitled, "Assessment of Distribution Reliability Improvement Initiatives" ("Quanta Report"), that explained and summarized Quanta's review methodology, its findings, and its recommendations for further improving ENO's distribution reliability going forward.

Q12. WHAT IS YOUR IMPRESSION OF THE QUANTA REVIEW AND THE QUANTA REPORT?

A. I believe that having Quanta's distribution reliability experts come in and perform a review of ENO's reliability plan and procedures was helpful in several respects. In many ways, Quanta's review and conclusions confirmed what we already knew or suspected about ENO's distribution system. For instance, we knew that our reliability metrics had slipped in recent years and suspected that they would not match up favorably with the reliability metrics of high performing utilities selected by Quanta for benchmarking analysis. We also had a good idea that our reliability programs, such as the FOCUS and Backbone programs, were a reasonable approach to

maintaining current distribution system reliability and seeing incremental improvements in our reliability metrics and that our baseline reliability programs are typical of such programs used throughout the industry. Quanta also confirmed our belief – and strongly emphasized – that, given our legacy distribution construction and infrastructure, we will need grid modernization and distribution automation to see significant improvements in distribution reliability. Quanta also indicated that the deployment of advanced meters together with the upgrade of our outage management system ("OMS"), enterprise asset management system ("EAM") and distribution management systems ("DMS") will provide useful data for further improvement of our reliability planning and project execution.

The good news is that Entergy and ENO have been working on the extensive analysis needed to begin the arduous process of implementing grid modernization for the last couple of years, and the first few projects are either underway or rapidly approaching the starting line. Additionally, advanced meters will begin being deployed in the coming months as will the upgrades to our OMS, EAM, and DMS. In addition, ENO has begun aggressively implementing distribution automation ("DA") as evidenced by the installation of 26 new reclosers during 2018 as part of the Storm Hardening reconfiguration and sectionalization effort and has plans to install an additional 50 reclosers as part of the 2019 DA strategy.

Although none of these advancements will transform reliability overnight, the combination of the extensive reliability work and storm hardening work that has been performed over the last three years and the grid modernization and system

improvements that are coming, we expect to begin seeing steady improvements in distribution system reliability and with advanced distribution system planning.

IV. RELIABILITY WORK PERFORMED IN 2018

Q13. WHAT DISTRIBUTION SYSTEM RELIABILITY WORK DID YOUR GROUP PERFORM IN 2018?

A. Regarding two of our primary reliability programs, the FOCUS and Backbone programs, we selected 23 FOCUS Projects and 9 Backbone Projects to be completed during 2018. We completed 21 of the 23 FOCUS Projects, and the two projects that were not complete by year-end 2018 are expected to be completed by mid-January 2019. As for the Backbone Program, although we completed three of the nine Backbone Projects[3] in 2018, the remaining six Backbone Projects were approximately 80-90% complete at year end and are expected to be completed by mid-January 2019. Additionally, two of the Backbone projects and one of the FOCUS projects were also delayed because they involve excavation work near Mississippi River levees and the U.S. Army Corps of Engineers prohibits such work when the Mississippi River is at its current river level. These two remaining projects will be completed as soon as the Company is allowed to do so under U.S. Army Corps of Engineers regulations. Our Reliability Program Progress Report filed on November 30, 2018, provides a more

[3] It should also be noted that because ENO had numerous contractor crews that were performing storm hardening work at year end 2017 and were carried over to complete that storm hardening work in 2018, some of the proactive Backbone reliability work could not be scheduled until after the storm hardening work was completed after mid-year. Additionally, some of the delays related to the Backbone and FOCUS projects that were not complete by year end were caused because ENO was closely coordinating with customers to take the outages needed to perform the work at a time convenient for the customer taking into account schedules and weather-related issues.

detailed view of the projects that were selected to be worked and the actual work that was undertaken for those projects.

Q14. WHAT OTHER RELIABILITY WORK DID YOU PERFORM IN 2018 BEYOND THAT ASSOCIATED WITH THE FOCUS AND BACKBONE PROJECTS?

A. In 2018, in addition to the FOCUS and Backbone work discussed above, we invested approximately $16.5 million in Storm Hardening work that is also expected to provide long-term reliability benefits. This work was part of an approximately $31.4 million effort over 2017 and 2018 to work toward hardening portions of the distribution system that serve critical customers (e.g., police and fire stations, hospitals, etc.) to better facilitate restoration and resiliency after a major storm event.

In all, between our baseline reliability programs and our storm hardening work, ENO averaged over 16 four- or five-person contract work crews monthly during 2018, with the number of crews reaching 25 in some months. Additionally, ENO had 12 four- or five-person crews on standby for repairs in the event that Tropical Storm Gordon hit the New Orleans area and it became clear that Gordon would strike elsewhere, ENO employed those crews to perform reliability work. The reliability work performed by those crews on standby is estimated to have resulted in approximately 63,000 avoided customer interruptions.

Q15. HAVE YOU BEGUN TO SEE POSITIVE RESULTS FROM THE RELIABILITY AND STORM HARDENING WORK THAT HAS BEEN PERFORMED ON THE DISTRIBUTION SYSTEM?

A. Yes. Based on preliminary numbers as of the end of 2018, ENO distribution line system saw an approximately 20% overall reduction in customer interruptions in 2018 as compared with 2017. This is a very significant one-year reduction and reflects the intense reliability efforts being put forth by our team. Although this distribution line improvement was offset somewhat by a significant increase in transmission/substation-related outages in 2018, ENO nevertheless saw a slight overall improvement (approximately 3.5%) in "customer view" customer interruptions.

V. CONCLUSION

Q16. BASED ON YOUR EXPERIENCE AS A DISTRIBUTION ENGINEER AND SENIOR MANAGER WITH RESPONSIBILITIES OVER DISTRIBUTION OPERATIONS, DO YOU BELIEVE THAT ENO HAS ACTED REASONABLY AND PRUDENTLY IN MANAGING THE RELIABILITY OF ITS DISTRIBUTION SYSTEM AND IN ADDRESSING THE INCREASE IN OUTAGES EXPERIENCED IN RECENT YEARS?

A. Yes. Again, it is common for every utility across the United States to experience outage issues with respect to the distribution grid. Although not directly comparable, as discussed above, ENO has stacked-up reasonably well against other U.S. utilities with respect to its SAIDI and SAIFI scores from 2013 through 2015. Once ENO

began to see the increase in outages, it reacted by implementing robust incremental reliability work to mitigate the outages being experienced. Thus, the Company recognized an unfavorable reliability trend, dedicated the resources to address that problem, and is now beginning to see some positive results. ENO's actions in this regard were reasonable. ENO will continue to work to improve distribution reliability for its customers and seek to decrease the frequency of outages and to decrease the duration of any outages that do occur by executing a comprehensive, well-balanced ENO reliability strategy which will be described in greater detail in the upcoming reliability filing on January 18, 2019.

Q17. DOES THIS CONCLUDE YOUR SUPPLEMENTAL DIRECT TESTIMONY?

A. Yes, at this time.

AFFIDAVIT

STATE OF LOUISIANA

PARISH OF ORLEANS

NOW BEFORE ME, the undersigned authority, personally came and appeared, **Tad S. Patella**, 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.

Tad S. Patella

SWORN TO AND SUBSCRIBED BEFORE ME
THIS 9th DAY OF JANUARY, 2019.

NOTARY PUBLIC

My commission expires: at death

Harry M. Barton
Notary Public
Notary ID# 90845
Parish of Orleans, State of Louisiana
My Commission is for Life

BEFORE THE

COUNCIL OF THE CITY OF NEW ORLEANS

RESOLUTION DIRECTING ENTERGY NEW ORLEANS, INC. TO INVESTIGATE AND REMEDIATE ELECTRIC SERVICE DISRUPTIONS AND COMPLAINTS AND TO ESTABLISH MINIMUM ELECTRIC RELIABILITY PERFORMANCE STANDARDS AND FINANCIAL PENALTY MECHANISMS	**)**	**DOCKET NO. UD-17-04**

DIRECT TESTIMONY

OF

WILLIAM L. SONES

ON BEHALF OF

ENTERGY NEW ORLEANS, LLC

JANUARY 2019

TABLE OF CONTENTS

TABLES

CHARTS

FIGURES

I. INTRODUCTION AND BACKGROUND

Q1. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A. My name is William ("Bill") L. Sones. My business address is 639 Loyola Avenue, New Orleans, LA 70113.

Q2. BY WHOM ARE YOU EMPLOYED AND IN WHAT CAPACITY?

A. I am currently employed by Entergy Services, LLC ("ESL")[1] as the Director of Grid Operations – Louisiana, which includes Entergy New Orleans, LLC ("ENO" or the "Company") and Entergy Louisiana, LLC ("ELL").

Q3. ON WHOSE BEHALF ARE YOU TESTIFYING?

A. I am filing this Direct Testimony before the Council of the City of New Orleans (the "Council") on behalf of ENO.

Q4. PLEASE DESCRIBE YOUR EDUCATION AND PROFESSIONAL EXPERIENCE.

A. Prior to joining Entergy in 2001, I was enlisted in the United States Navy for 11 years and I am a Gulf War Veteran. While in the Navy, I served in various capacities

[1] ESL is a service company affiliate of Entergy New Orleans, LLC ("ENO," or the "Company") that provides general executive, management, advisory, administrative, human resources, accounting, finance, legal, regulatory, and engineering services. These services are provided in accordance with Service Agreements entered into by ESL and the Operating Companies, to which ESL provides services, and are approved by the Federal Energy Regulatory Commission. The Entergy Operating Companies include, in addition to ENO, Entergy Mississippi, LLC; Entergy Arkansas, LLC; Entergy Louisiana, LLC; and Entergy Texas, Inc.

around the world. I was the Engineering Officer of the Watch ("EOOW") on the USS Scott (DDG 995), a Kidd-class Destroyer. I was also the EOOW on the USS Thomas S Gates (CG 51), a Ticonderoga-class Guided Missile Cruiser. In this capacity, I was responsible for the safe and reliable operation of all propulsion, generation and ancillary equipment necessary to operate the ship. I was awarded the Navy Achievement Medal six times during my enlistment and was selected as the Sailor of the Year for performance completed onboard the USS Thomas S Gates (CG-51). I am also Enlisted Surface Warfare Qualified. I was selected for advancement to Chief Petty Officer (E-7) in 2001 but decided to leave the Navy to complete my education and to pursue a career at Entergy. I was Honorably Discharged from the Navy in the Fall of 2001. Since joining Entergy in 2001, I have worked in various positions throughout Entergy's service territory, with progressive managerial responsibilities for transmission line and substation operations, maintenance, and capital projects. In 2003, while working for Entergy as a Transmission Specialist, I enrolled in the Electrical Engineering Program at the University of New Orleans ("UNO"). From 2003 to 2009, I trained technicians throughout Entergy's four-state service territory in protective relaying principles and maintenance.

In 2009, I received my Bachelor of Science degree from UNO in Electrical Engineering and from 2009 to 2012, I worked as a Transmission Line Reliability Engineer at Entergy's Transmission headquarters in Jackson, Mississippi. In this capacity, I evaluated and proposed reliability improvements for transmission lines in Entergy's service territory. In 2012, I was promoted to Manager of Transmission Lines for Entergy Texas, Inc. ("ETI"), performing various duties, including

responding to transmission line outages, providing storm response, and managing transmission line crews, operational coordinators, and engineers who executed a portfolio of capital and maintenance reliability projects.

Subsequently, I became the Manager of Substation Operations for ETI. In this role, I was responsible for operating and maintaining all Entergy substations in Texas. While serving in this capacity, I managed substation capital projects and operations and maintenance ("O&M") projects, including the planning, engineering, scheduling, and execution of those projects. Ultimately, I ensured that the substation reliability project portfolio was executed on time and on budget.

In July 2014, I was promoted to Manager, Transmission Line Design. In that role, I was responsible for leading a team of engineers and engineering associates who designed transmission lines, created transmission line standards for Entergy's four-state transmission system and served as the Engineering Authority for all transmission line issues.

In November 2016, I was promoted to my current position as the Director of Grid Operations for Louisiana. In my current role, I am responsible for all of Entergy's transmission line and substation operations in Louisiana.

I am a licensed Professional Engineer in the state of Louisiana.

Q5. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A. The purpose of my testimony is to support the Company's response to Council Resolution R-18-475 and to help demonstrate that ENO's capital and O&M investments in transmission reliability programs have been reasonable and prudent,

and that the measures ENO has taken to address recent reliability challenges are also reasonable and prudent, and strike a reasonable balance between (i) the need to make certain capital and O&M transmission line and substation investments and (ii) the cost to customers of making those investments. I will also provide an overview of the ENO's reliability programs, as well as recent transmission reliability upgrades that address transmission line and substation assets. Finally, I briefly discuss upcoming initiatives that can be used to improve reliability for ENO's customers.

Q6. HAVE YOU PREVIOUSLY PROVIDED TESTIMONY IN ANY REGULATORY PROCEEDING?

A. No. This is the first time that I have submitted testimony in any regulatory proceeding before the Council or any Public Service Commission.

Q7. PLEASE DESCRIBE HOW THE REMAINDER OF YOUR TESTIMONY IS ORGANIZED.

A. In Section II, I present an overview of ENO's transmission system and ENO's reliability planning processes. In Section III, I address ENO's transmission reliability efforts and results, and demonstrate that those efforts have been reasonable and prudent. Finally, in Section IV, I provide the conclusion to my testimony.

II. OVERVIEW OF THE ENO TRANSMISSION SYSTEM AND ENO'S RELIABILITY PLANNING PROCESSES

Q8. PLEASE PROVIDE A GENERAL DESCRIPTION OF THE ENTERGY TRANSMISSION SYSTEM.

A. The Entergy transmission system[2] delivers approximately 23,500 MegaWatts ("MW") of Entergy-owned generation and non-Entergy-owned generation within a 114,000 square-mile area. The transmission system moves power across a grid of approximately 15,700 miles of interconnected transmission lines and approximately 1,600 substations to distribution delivery points for delivery to the combined Entergy Operating Companies' ("EOCs") approximately 2.9 million retail customers, which include over 200,000 customers of ENO. The Operating Companies also provide nondiscriminatory transmission access for wholesale suppliers and customers.

Q9. PLEASE PROVIDE A BRIEF DESCRIPTION OF ENO'S TRANSMISSION SYSTEM.

A. The ENO transmission system is comprised of 23 transmission substations and approximately 150 circuit miles of transmission lines, including portions of transmission lines interconnecting those substations with ELL's and Cleco Power, LLC's transmission facilities. These 23 ENO transmission substations include: Almonaster, Avenue C, Bayou Sauvage, Claiborne, Curran, Delta, Derbigny, Gentilly

[2] The combined transmission systems of Entergy Arkansas, LLC.; Entergy Louisiana, LLC; Entergy Mississippi, LLC.; Entergy New Orleans, LLC; and Entergy Texas, Inc. (the EOCs) comprise the Entergy transmission system. The entire Entergy transmission system was integrated into the MISO RTO in December 2013.

Road, Gulf Outlet, Holiday, Joliet, Lower Coast, Market Street 115 kV, Market Street 230 kV, Michoud, Midtown, Napoleon, Notre Dame, Paterson, Pauger, Pontchartrain Park, Sherwood Forest, and Tricou.[3]

Q10. WHAT GENERAL FUNCTIONS DO THE ENTERGY TRANSMISSION SYSTEM FACILITIES (INCLUDING ENO'S) SERVE?

A. Entergy's transmission system facilities, including ENO's, are used to move high-voltage bulk electric power produced by market participants (including the EOCs) within the Midcontinent Independent System Operator, Inc. ("MISO") regional transmission organization ("RTO") footprint. The MISO RTO footprint consists of an interconnected system of transmission lines and substations transmitting electrical power to points of delivery for (i) retail customers of the EOCs, (ii) other transmission system users such as municipalities and cooperatives, and (iii) other transmission systems. The Entergy transmission system facilities also deliver power directly to some large commercial and industrial retail customers of ENO and the other EOCs. Transmission-level customers include refineries, chemical plants, oil and gas processing facilities, pumping stations, and large manufacturing sites vital to the region and the nation.

[3] In Docket No. UD-17-04, Company Witness Tad S. Patella cited 20 distribution substations in his Direct Testimony filed in this docket on June 6, 2018. The difference in the substation count is due to the inclusion here of the Bayou Sauvage, Gentilly Road, Michoud, and Market 115 kV substations, which are all transmission switching stations that do not serve any ENO distribution feeders. Additionally, the 20 distribution substations cited by Mr. Patella included the Southport substation, which was included in the ENO distribution substation count because it serves feeders that are owned by ENO and that serve ENO customers. though the substation itself is owned by ELL.

Q11. WHAT ARE THE PRIMARY RESPONSIBILITIES OF THE TRANSMISSION ORGANIZATION?

A. The Transmission Organization, in coordination with MISO in certain areas as described herein, is primarily responsible for the planning, design, operation, maintenance, project management, and construction of the ENO transmission system.

Q12. PLEASE EXPLAIN ENO'S APPROACH TO ENSURING RELIABILITY FOR ITS CUSTOMERS VIA THE TRANSMISSION SYSTEM.

A. Entergy New Orleans takes seriously its obligation to provide safe and reliable electric service to its customers at a reasonable cost. The Company continuously strives for improvement in the delivery of reliable service to customers.

At the most basic level, the design of ENO's transmission system (i.e., how the transmission lines and substations are interconnected) and the design of the substations themselves, impact the level of reliability expected to be experienced by the system and ultimately by end-use customers. I will expound on this concept further below.

Broadly speaking, once the transmission system is built, there are two primary processes associated with maintaining and improving reliability and thereby reasonably minimizing the risk that the transmission system performance will cause or contribute to customer interruptions, including customers served from distribution feeders.

The first process involves installing new infrastructure and/or upgrading existing infrastructure to maintain a reliable and robust system capable of serving

existing and new customers under anticipated conditions. This is achieved through ENO's compliance with mandatory NERC reliability standards applicable to all transmission systems in North America.[4] This process of identifying and building transmission facilities to meet NERC reliability standards and to maintain transmission system reliability is referred to herein as Transmission System Planning.

The second process, which is the primary focus of this testimony, is generally referred to as asset management, and is meant to ensure that existing transmission facilities perform as designed. Recognizing that even properly designed and maintained facilities can fail to perform as designed, ENO seeks to reasonably minimize such occurrences and their impact, largely guided by the Company's knowledge and assessment of the system assets and the impacts upon it from external sources. This aspect of maintaining reliability is referred to herein as Infrastructure Reliability Planning and consists of maintaining assets as well as the programmatic replacement of assets. The combination of Transmission System Planning and Infrastructure Reliability Planning is important in building and maintaining a reliable transmission system.

I will provide more detail for these two processes in Section III of my testimony.

[4] The NERC Reliability Standards define the reliability requirements for planning and operating the North American bulk power system. The Entergy Operating Companies' local transmission planning criteria is a companion to NERC Reliability Standard TPL-001-4 (Transmission System Planning Performance Requirements), which sets specific criteria used to measure the performance of the transmission system.

Q13. PLEASE PROVIDE MORE INFORMATION ON ENO'S TRANSMISSION SYSTEM CONFIGURATION AND HOW IT CAME TO INTO BEING.

A. Within the electric power industry, it is a common saying that transmission system planning is an art and a science. While there is engineering discipline behind decisions that are made, the determination of which voltage to use and what type of substation to build are dependent on numerous factors including cost and design requirements/ guidelines at the time the facilities were constructed.

I am not intimately aware of the origin of ENO's transmission system, but the majority of ENO's transmission lines and substations were built prior to 1970. The transmission system was constructed to primarily transport local generation to local customers. Some of that generation, such as the Market Street and Paterson power plants, were decommissioned over time. It was likely operated in a "hub and spoke" manner where there were effectively islands of generation balanced with customers' electricity demand. Over time, these systems were consolidated and networked together to provide greater system reliability.

As the sources of generation changed and customers' electricity usage increased, ENO installed new substations and transmission lines to serve the customers. Higher voltage transmission lines operating at 230kV were constructed to more efficiently and reliably move generation around.

Q14. HOW CAN ENO'S SUBSTATION CONFIGURATIONS IMPACT THE LEVEL OF RELIABILITY EXPECTED TO BE EXPERIENCED BY THE SYSTEM AND ULTIMATELY BY END-USE CUSTOMERS?

A. While many of ENO's substations are configured with transmission-voltage circuit breakers, some are not. A substation protected by transmission-voltage circuit breakers will have a higher degree of reliability (and also higher cost) than an intermediate substation that does not have transmission-voltage breakers. The decision made years ago not to install circuit breakers at these intermediate substations may have been due to their proximity to nearby substations that already have breakers to effectively protect these intermediate substations. Given the density of customers in New Orleans, space requirements may also affect substation configuration decisions.

With respect to the substation design itself, a similar concept applies. There are various substation bus configurations and differing attributes for each. For example, a substation that is configured in a "ring bus" will inherently be more reliable than a substation that has a "single bus" configuration, but a ring bus substation will have a higher cost than a single bus substation. That is, a ring bus substation will require more substation equipment and circuit breakers than a single bus substation. The attributes of a single bus configuration include: low cost, small land area, relative simplicity for the application of protective relaying, and lower reliability compared with other configurations. The predominant substation configuration for ENO's substations is a single bus configuration. Other

configurations used by ENO are ring bus, operating bus/ transfer bus, and breaker-and-a-half.

Thus, the level of robustness of a transmission system to limit the impact of outages depends on the transmission line and substation configuration. While I am not able to opine on the legacy planning and design decisions from decades ago that led to how ENO substations and transmission lines are configured, there may be opportunities to improve ENO's transmission system reliability by installing additional equipment, reconfiguration, or some other measures that I will describe further below.

III. TRANSMISSION RELIABILITY EFFORTS AND RESULTS

A. TRANSMISSION SYSTEM PLANNING

Q15. EXPLAIN ENO'S TRANSMISSION SYSTEM PLANNING PROCESS.

A. ENO, as the transmission owner, is responsible for conducting local transmission system planning through MISO's planning process. To do so, the Company applies NERC reliability standards to determine the transmission facilities that should be constructed to maintain reliable service in the event of certain system contingencies prescribed by the reliability standards.

Mandatory reliability standards impact transmission planning and investment. However, in a transmission system such as ENO's, few new transmission projects are generally identified as needed, as the system already meets the mandatory reliability standards. The Transmission Organization's compliance with the NERC reliability standards is intended to mitigate the risk that outages to parts of the transmission

system will cause or contribute to customer outages. This is achieved by designing and building capacity into the transmission system to allow the transmission system to continue to reliably operate under various potential unplanned outage scenarios defined as planning events in the NERC standards. Thus, Transmission System Planning is the first method of assuring that the transmission system can experience outages to certain facilities and yet continue to provide reliable electric service to the Company's customers. Transmission projects resulting from the Transmission System Planning process can be a significant portion of ENO's transmission system capital expenditures and are critical to the continued reliable operation of the transmission system because without these projects (or alternative mitigation actions) continued reliable service to customers cannot be assured.

Q16. WHAT RELIABILITY-FOCUSED CAPITAL INVESTMENTS HAS ENO RECENTLY COMPLETED?

A. From 2013 to 2018, ENO completed a number of projects to address compliance with NERC reliability standards, to adhere to MISO's planning process, and to reliably serve customers. These projects, which were vetted through MISO's planning process, include the following:

- Almonaster to Midtown – Reconductor 230kV line: This project was identified by MISO as a required upgrade to ensure full power deliverability from the St. Charles Power Station, a new gas generation facility under construction near the existing Little Gypsy power plant in Montz, Louisiana. Once completed, this generating facility will provide low cost, flexible

capacity and energy in the Amite South region, which includes ENO's service area. The total estimated cost of the project is approximately $2.3 million.

- Ninemile to Derbigny – Upgrade 230kV line: MISO's planning studies for the planned deactivation of Michoud Unit 3 indicated that loss of Ninemile to Napoleon 230kV transmission line would result in a thermal overload of the Ninemile to Derbigny 230kV transmission line. To avoid this thermal constraint and to comply with NERC reliability standards, ENO rebuilt the Ninemile to Derbigny 230kV line and upgraded substation equipment. The total cost of the project was approximately $12.0 million.
- Ninemile to Napoleon – Upgrade 230kV line: MISO's planning studies for the planned deactivation of Ninemile Unit 3 and Michoud Unit 2 indicated that the loss of Ninemile to Derbigny 230 kV transmission line would result in a thermal overload of the Ninemile to Napoleon 230 kV transmission line. To avoid this thermal constraint and to comply with NERC reliability standards, ENO rebuilt the Ninemile to Napoleon 230 kV line and upgraded substation equipment. The total cost of the project was approximately $11.8 million.
- Claiborne Substation – Upgrade underrated 115kV circuit breakers N0143-ICBO and N0123-ICBO: ENO's routine planning analysis to assess short circuit capability (the ability of circuit breakers to isolate failed portions of the transmission system) identified two underrated circuit breakers at Claiborne Substation. Power system changes over time can cause circuit breakers to be underrated. To maintain safety and reliability, breakers N0123 and N0143

were upgraded to units with a higher short circuit rating. The total cost of the project was approximately $0.4 million.

- Market Street Substation – Upgrade bus and jumpers: MISO's planning studies for the planned deactivation of Michoud unit 2 and Ninemile Unit 3 indicated that the Market Street 230/115kV autotransformer bay needed to be upgraded due to changes in power flows. To alleviate this thermal constraint and to comply with NERC reliability standards, ENO replaced all limiting bus equipment and jumpers in the autotransformer bay to ensure the full use of the autotransformer capacity. The total cost of the project was approximately $0.2 million.
- Midtown Substation – Add 230kV distribution transformers: Due to significant economic growth in the New Orleans Mid-City area, ENO installed additional distribution transformer and feeders at the Midtown Substation. The economic growth was attributed to the U.S. Veterans Administration Hospital, the University Medical Center, the Orleans Parish Sheriff`s Office, the Louisiana Cancer Research Center, the Mercedes Benz Superdome, and Xavier University. The total cost of the project was approximately $26.1 million.

While these projects do not specifically address the causes of outages recently experienced by ENO, they address reliability issues from a broader system perspective by increasing transmission capacity and ENO's ability to reliably serve customers. Without the construction of these projects, the system could have experienced additional reliability issues. Furthermore, while it is difficult to quantify,

having newer assets can result in higher reliability, as these newer assets would be less prone to failure in comparison with older assets.

Q17. ARE THERE OTHER NEAR-TERM PROPOSED RELIABILITY-FOCUSED CAPITAL INVESTMENTS?

A. Yes. In 2019, the Company expects to complete the reconductoring of the Paterson to Pontchartrain Park 115kV transmission line. This project is needed to comply with NERC reliability standards and to prevent potential overload under the contingency loss of the Avenue C to Paris 115kV line.

B. INFRASTRUCTURE RELIABILITY PLANNING

Q18. PLEASE EXPLAIN IN GREATER DETAIL ENO'S INFRASTRUCTURE RELIABILITY PLANNING PROCESS AND HOW THE COMPANY WORKS TO ENSURE THAT ITS CUSTOMERS RECEIVE QUALITY RELIABLE ELECTRIC SERVICE FROM ITS TRANSMISSION SYSTEM.

A. The Transmission Asset Management Department has primary responsibility for the development and execution of maintenance and capital reliability projects and programs. To accomplish this, the Asset Management Department is comprised of a central support group, Asset Management Strategy, the Grid Operations group for ENO and ELL, and other supporting organizations that include safety and skills training.

The Asset Management Strategy group includes organizations with primary responsibility for the development of strategic programs to maintain the integrity and

reliability of the transmission grid. These include asset renewal programs focused on prioritized replacement of degraded substation and transmission line assets and the development of annual maintenance plans that provide the appropriate level of maintenance to the equipment that comprises the system. Asset Management Strategy also includes other groups that have responsibility for validating operational risk reviews, configuration and control of equipment information and reliability performance, and the execution of special projects.

The Grid Operations group is the execution arm of the Asset Management organization. This group plans and coordinates the execution of the annual maintenance plan that has been developed. Additionally, this group performs the majority of capital asset renewal program activities on substation and transmission line equipment. The Grid Operations group is also responsible for responding to real-time conditions when equipment alarms are received, preparing the system to withstand major storms and extreme weather, and responding to outages, twenty-four hours a day, seven days a week.

Q19. PLEASE DESCRIBE THE ASSET MANAGEMENT RELIABILITY PROGRAMS ASSOCIATED WITH INFRASTRUCTURE RELIABILITY PLANNING.

A. Infrastructure Reliability Planning involves maintaining and improving transmission reliability and working to ensure that all components of the transmission system remain in service and perform as designed. ENO seeks to reasonably minimize transmission facility outages and subsequent impacts to customers through optimized design, operations and maintenance practices, and strategic investment. Infrastructure

Reliability Planning encompasses two parts: 1) replacement of aging infrastructure before it fails through Asset Renewal Programs, which are discussed in detail below, and 2) maintenance on equipment and lines (i.e., Asset Management Operations and Maintenance).

ENO's Asset Renewal Programs seek to reasonably anticipate the failure of aging facilities by replacing those facilities before they fail, and they are tailored to reduce the potential for customer interruptions. The term "renewal" as used herein typically refers to the replacement of existing infrastructure with a new unit (e.g., replacement of an electromechanical relay with a digital relay, replacement of an older transformer with a new unit, replacement of wood poles with steel or concrete structures, etc.). In some cases, it can mean a significant reconditioning overhaul or restorative repair (e.g., replacement of worn contacts or components, replacement of gaskets, etc.). Asset renewal programs also provided additional benefits such as the installation of equipment designed to prevent outages caused by animal intrusion and increase security at substations to prevent physical and cyber attacks that could cause outages.

The table below shows ENO's spending on various asset renewal programs for the past five years.

Table 1. Transmission Asset Management Spending (2014-2018)

Recurring Transmission Asset Management Spending ($ millions)					
Category	2014	2015	2016	2017	2018
Substation – Distribution Equipment	1.4	3.2	3.8	3.6	3.9
Substation – Transmission Equipment	1.3	0.6	1.9	0.2	1.5
Transmission Line	0.3	1.0	0.1	4.2	0.4
Other	0.2	0.1	0.0	-0.1	0.0
TOTAL	3.2	4.8	5.8	7.9	5.7

Note: Amounts may not tie due to rounding.

A description for these categories are as follows:

- Substation – Distribution Equipment: Includes asset management investments for the *distribution* portion of substations, which includes assets operating at a distribution voltage and inclusive of power transformers (e.g., 115kV/13.8kV power transformers, 13.8 kV feeder breakers and switches inside a substation).
- Substation – Transmission Equipment: Includes asset management investments for the *transmission* portion of substations, which includes assets operating at a transmission voltage (e.g., 115kV circuit breakers, 230/115kV autotransformers).
- Transmission Line: Includes asset management investments for transmission line assets operating at 69kV and higher (e.g., 115kV and 230kV transmission lines, structures, and towers).
- Other: Includes miscellaneous items.

In general, Infrastructure Reliability spending on transmission facilities is prioritized to those facilities affecting the customer view of interruptions as measured

by certain historical performance indices (i.e., T-SAIDI and T-SAIFI)[5], as well as the potential impact of an interruption given total customer impact and critical customer electricity demand at a site. This prioritization balances the provision of reliable transmission service with the reduction in costs ENO's customers realize from extending the life of transmission assets and minimizing maintenance costs with respect to those assets.

Annually, the Transmission Asset Management Department reviews system performance and updates the risk assessment priorities of ENO's transmission assets and develops the capital and maintenance strategies for the following year based on those assessments. Optimizing program plans and their execution is an iterative process. Emerging technologies are (i) assessed for application on the ENO transmission system and (ii) modeled to determine their potential for reducing equipment failure rates, customer interruptions, customer outage duration, ongoing O&M, or capital failure funding requirements.

Certain budget decisions, such as the prioritization of projects and activities within Asset Renewal Programs, are based on a risk score methodology. This methodology is used to rank assets within asset classes, such as transformers, protection systems, breakers, or transmission lines, for prioritization purposes. Risk scores are the product of probability of failure (health) and consequences. Each major asset class has its own criteria for health and consequences. Health typically involves criteria such as age, history, and inspection or diagnostic test results.

[5] T-SAIDI is an acronym for Transmission-System Average Interruption Duration Index. T-SAIFI is an acronym for Transmission- System Average Interruption Frequency Index.

Consequences typically include factors such as customer electricity demand, availability, customer counts, and costs.

Once the risk scores are determined, project optimization begins. Optimization involves the coordination of resources (internal and external), planned outages (including MISO approvals of outages), and bundling of projects driven by other programs. Bundling of projects is a factor due to potentially significant efficiency gains. Bundling can reduce mobilization, demobilization, engineering, switching, planning, contracting, and administrative costs thus allowing for more assets to be addressed. Specifically, with respect to oil-filled equipment, environmental risk is also a factor that causes the Transmission Asset Management Department to examine how environmental risk should be incorporated and weighted for prioritization purposes.

Asset Renewal Programs contribute to the overall reliability of the system, whether or not clear results can be discerned in the short term. It is important to remember that ENO's transmission system is not serving customers in a closed, controlled environment. External factors such as weather or public interference, will continue to impact reliability statistics over time. While Asset Renewal Programs are not going to eliminate external factors, the successful execution of these programs can reduce the frequency and severity of system outages.

Q20. PLEASE SUMMARIZE THE ASSETS THAT WERE RENEWED IN THE LAST FIVE YEARS AS A RESULT OF THE ASSET RENEWAL PROGRAMS.

A. The assessment and prioritization programs discussed above resulted in the following assets renewals from 2014 through 2018.

Table 2.
Number of Assets Renewed by Type (2014-2018)

Number of Assets Renewed by Type						
Asset Management Programs	2014	2015	2016	2017	2018	Total
Substation - Distribution Equipment						
Circuit Breaker Replacements	2	6	-	5	4	17
Relay Improvements	-	1	5	-	6	12
Animal Mitigation	2	-	-	1	5	8
Remote Terminal Unit (RTU) Replacements	-	1	-	-	-	1
Switch Replacements	-	-	1	-	-	1
Transformer Life Extension	-	3	10	2	1	16
Arrester Replacements	1	4	2	-	-	7
Substation – Transmission Equipment						
Circuit Breaker Replacements	7	-	3	-	-	10
Relay Improvements	2	-	4	-	1	7
Instrument Transformers	-	1	-	-	-	1
Transmission Line Equipment						
Shield Wire Replacements	-	4	3	-	-	7
Misc. Component Replacements	13	5	-	-	95	113

Q21. WHAT IMPACT DID ENO'S ASSET RENEWAL PROGRAMS HAVE ON THE AVERAGE AGE OF CIRCUIT BREAKERS IN PARTICULAR?

A. Between 2014 and 2018, ENO also improved its average age of substation breakers. ENO's Circuit Breaker Renewal Program targeted older vintage High Voltage

("HV") breakers and Low Voltage ("LV") breakers for replacement with modern breakers, which are less susceptible to failure. As a result, the average age of ENO's substation breakers has decreased, as shown in the following table.

Table 3.
Average Age of Circuit Breakers by Voltage Level Type

Average Age of Circuit Breakers by Voltage Level Type			
Asset Type	Average Age In 2014	Average Age In 2018	Number of Assets
High Voltage Breakers (115kV & 230kV)	20	18	65
Low Voltage Breakers (< 69kV)	28	27	290

Q22. IS IT TYPICAL FOR AN ELECTRIC TRANSMISSION SYSTEM TO EXPERIENCE OUTAGES THAT RESULT IN CUSTOMER INTERRUPTIONS?

A. Typically, designing the transmission system to NERC reliability standards results in a robust transmission system that has a generally high level of reliability. Consequently, transmission system availability is generally over 99.9%. In some instances, however, due to the configuration of certain portions of the transmission system, it is possible for the system to experience outages. For example, a substation that is protected by transmission-voltage breakers will rely less on the transmission-voltage breakers of the adjacent substations. If an intermediate substation does not have transmission-voltage breakers, then it will be subject to removal from service when a fault occurs on the "breaker-to-breaker" segment.

So, while transmission outages are far less common than outages resulting from events on the distribution system, they do occur periodically. ENO's transmission system has typically performed in the second quartile for reliability;

however, the system has also experienced years of volatility between first quartile and fourth quartile performance in recent years.

Q23. WHAT TYPES OF EVENTS CAN CAUSE OUTAGES ON THE TRANSMISSION SYSTEM, AND CAN TRANSMISSION OUTAGES OCCUR ON FAIR-WEATHER DAYS?

A. Transmission system outages can result from many different types of events. Some of the more common causes include: equipment failure, public interference, human performance, animal contact, weather, and vegetation contacts. For ENO, these outages can also be largely driven by legacy configuration challenges, as discussed more fully below, that may exacerbate the impact of transmission system outages. Due to these challenges, outages may be extended in duration or can impact more customers than if these legacy issues did not exist.

ENO Transmission has characterized the major drivers of events since 2008 by the following three main categories: Asset Condition, System Configuration, and Human Performance. While asset condition is the most frequent initiator of outage events on the system, events associated with legacy system configurations can lead to longer duration and larger impact events, causing a substantial amount of volatility in the reliability performance of the system year-to-year.

Due to the variety of drivers, transmission outages can occur at any time, even on fair-weather days. While it is more frequent and common for events to occur during severe weather events; events driven by other outage causes such as equipment

failure, animal contact, public interference, or human performance issues can occur at any time.

Q24. DO LEGACY CONFIGURATION CHALLENGES MAKE THE ENO TRANSMISSION SYSTEM MORE VULNERABLE?

A. Yes. Legacy system configurations contribute to higher ENO customer exposure to outages. The transmission configuration does present additional exposure and vulnerability by interconnecting the distribution substations with legacy designs that were considered "adequate" standards at the time of construction. For example, large power (substation) transformers with capacity of 100 MVA lead to higher customer exposure to single events. Each of these 100 MVA substation transformers serves an average of 7,500 customers, with some serving more than 13,000 customers. Over 40% of ENO's substation transformers are 100 MVA class.

Additionally, multiple lines on a single bus without transmission line breakers create the potential for a single event to cause an outage of the entire substation. Consequently, substations without transmission line circuit breakers lead to higher customer exposure to transmission line outages.

Q25. PLEASE EXPLAIN ENO'S USE OF RELIABILITY METRICS IN INVESTMENT DECISIONS AND DEVELOPMENT OF GOALS.

A. ENO, like many other utilities, uses reliability metrics such as SAIFI and SAIDI, among other considerations, to help prioritize infrastructure reliability planning projects. ENO participates in the Southeastern Electric Exchange ("SEE"), from

which ENO receives such guidance. The SEE reports contain enough granular data such that ENO can compare its T-SAIFI and T-SAIDI scores to similar utilities to compare and inform ENO's evaluation of its own reliability. Because these reliability studies are generally protected by confidentiality agreements that restrict the Company's ability to disclose the data externally, even with our regulators, no studies provide detail below the company level, such as for individual customer classes (e.g., residential, commercial, industrial, governmental).

Utilities participating in SEE range from small systems serving just a few thousand customers to multimillion-customer systems. Utilities are given an anonymous identifier and segmented by size and continental region. Each utility provides summarized reliability data, which is processed to segregate major event reliability from day-to-day events. The summary data includes the number of customers across the systems that are interrupted during each day and the total minutes of customer interruption. This is divided by the number of customers served by the system, which leads to SAIFI and SAIDI values.

As mentioned above, the SEE benchmarking studies inform ENO's analyses of its own reliability data and effectiveness of the capital investments intended to improve reliability. However, anyone using these types of multi-utility sampling results should be cautious about the conclusions that may be drawn from the data. For example, knowing what specific parameters may be driving results (e.g., customer density, environmental exposure, geographic region, or customer growth) is key to understanding where a utility falls within these types of samples.

This limitation of transmission reliability benchmarking studies and the caveats needed to understand the results are explained by SGS[6] as follows:

> Top quartile or decile performance has an appealing cachet, but it may be "too good" or "not good enough", depending on circumstance. Our seventeen years of experience confirms that a system seldom is simultaneously first quartile in all reliability parameters. All systems have differing *Adequate Levels of Reliability* and one size certainly does not fit all. ….
>
> System-level performance metrics, in our opinion, are informative but should never be the final arbiter of performance. They seldom quantify customer experiences, nor the ability of a transmission owner to meet customer expectations.[7]

Reliability benchmark data is just one piece of information that is used in determining the appropriate set of targets for ENO. Other factors influencing ENO's decisions include, for instance, past performance, ENO's design criteria and equipment age and condition, past spending levels, and past non-controllable events.

It also is important to understand that every electric system will experience customer interruptions. Interruptions occur when fault events happen. Fault events can be the result of a lightning strike, a traffic accident, a piece of equipment reaching its end of life, or simply malfunctioning before the end of its expected useful life. When these events occur, system protective equipment interrupts the flow of electricity to allow the system to be restored safely. Restoration can be completed by dispatching trouble crews or by use of certain automated equipment. Measuring how

[6] SGS is (formerly Société Générale de Surveillance (French for General Society of Surveillance)) is self-described as the world's leading inspection, verification, testing and certification company recognized for its quality and integrity for their global benchmarking services.

[7] 2011 SGS Transmission Reliability Benchmarking Study, pp. 4-5.

often and where these events occur, and looking for patterns, are important for utility engineers and operational staff to resolve persistent reliability issues.

Q26. WHAT IS THE RESULT OF THE ANNUAL TRANSMISSION RELIABILITY DATA FOR THE PERIOD OF 2014 – 2018?

A. ENO tracks reliability data and uses that information to make planning and investment decisions. Below is a table showing ENO's data for the years 2014-2018. As shown, in the following table, ENO began to experience improved reliability until an unusual series of events throughout 2018 reversed that trend.

Table 4.
ENO Transmission System Reliability Metrics (2014-2018)

ENO Transmission System Reliability				
Year	ENO T-SAIFI	SEE Average T-SAIFI[8]	ENO T-SAIDI	SEE Average T-SAIDI
2014	0.390	Not Available	22.5	Not Available
2015	0.186	Not Available	8.9	Not Available
2016	0.169	0.225	16.8	20
2017	0.210	0.233	12.7	22
2018	0.464	Not Yet Available	23.2	Not Yet Available

Q27. YOU MENTIONED THAT MOST UTILITIES USE T-SAIDI AND T-SAIFI INDICES AS MEASURES FOR REVIEWING THE RELIABILITY OF THEIR SYSTEM. IS THERE VALUE OF COMPARING INDICES BETWEEN

[8] The SEE data for T-SAIFI and T-SAIDI were not developed prior to 2016. The 2018 data is expected to be available around September 2019.

UTILITIES DESPITE THE MANY VARIABLES THAT CAN AFFECT THOSE METRICS?

A. Yes. The Company believes that it is useful to be aware of how other utilities are performing and how it roughly compares with those utilities, as benchmarking can provide an important vehicle for performing critical self-assessment and ultimately remedying any significant dips in transmission system reliability.

Q28. PLEASE PROVIDE A SUMMARY OF ENO'S TRANSMISSION SYSTEM RELIABILITY PERFORMANCE IN RECENT YEARS.

A. Table 5 below provides a summary of the number of events on ENO's transmission and substation facilities that led to ENO customer interruptions through December 2018.

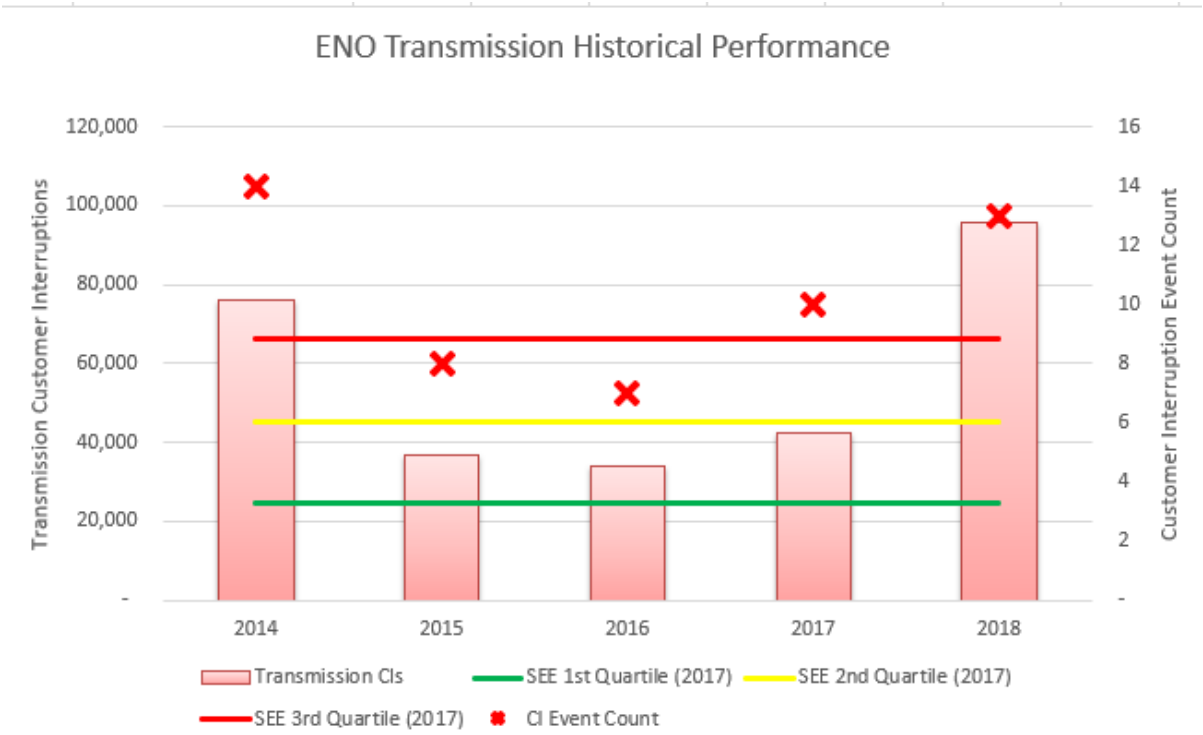
Table 5.
ENO Transmission System Reliability Performance Details (2014-2018)

ENO Transmission System Reliability Performance Details					
	2014	2015	2016	2017	2018
# of events	14	8	7	10	13[9]
# of customer interruptions	76,274	36,961	34,185	42,442	95,617

As you can see from Chart 1 below, ENO's Transmission reliability performance has frequently been second quartile performance or better. However, this figure also demonstrates the variability in performance for the reasons described above.

[9] An event at Pauger Substation, on October 21, 2018, was excluded from reliability metric calculations due to Major Event Day ("MED") rules. However, the event resulted in an impact to 17,600 customers for 3 hours.

Chart 1.
ENO transmission/substation performance & customer interruptions (2014-2018)



Q29. WHAT ARE THE KEY TAKEAWAYS FROM THE HISTORICAL TRANSMISSION SYSTEM OUTAGE INFORMATION?

A. Outages on ENO's transmission system will vary from year to year. A higher number of outages does not necessarily result in a higher number of customers interrupted. The number of customers interrupted by a transmission event depends on the specifics of each event (e.g., equipment affected, location of outage, substation affected, etc.). Historical data demonstrates that reliability performance has been fairly consistent second quartile performance as compared with peers in the SEE benchmarking efforts. It also demonstrates that performance will continue to be

volatile from year-to-year given existing system configuration challenges and the inability to control certain initiating events.

Q30. COMPARED WITH DISTRIBUTION, WHY DOES A TRANSMISSION EVENT TYPICALLY RESULT IN A SIGNIFICANTLY LARGER NUMBER OF CUSTOMER INTERRUPTIONS?

A. As described above, the function of the transmission system is to deliver power to substations, where it is further transformed from transmission-voltage to distribution-voltage for delivery to customers. An outage of a transmission line could potentially remove an entire substation or multiple substations from service. The outage of a substation component, such as a circuit breaker or power transformer, can remove portions of a substation from service, and result in outages to a portion of the customers served from the substation.

The protection system of ENO's transmission facilities is designed such that certain elements must be taken out of service to maintain the integrity and reliability of the rest of the ENO grid. For example, if a lightning strike were to occur on a transmission line segment from substation A to substation B, the protection system is designed to remove from service that line segment impacted by the fault. Consequently, any intermediate substation served from that line, and without transmission-voltage circuit breakers will be also placed out of service. In doing so, the protection system ensures that the remainder of ENO's transmission system remains intact, and the non-affected customers remain in-service. This is similar to

how residential circuit breakers operate to isolate only those circuits affected by a fault.

Q31. CAN ENO'S TRANSMISSION SYSTEM BE DESIGNED IN SUCH A WAY THAT DISTURBANCES ON THE TRANSMISSION SYSTEM OR AT THE SUBSTATION WILL RESULT IN FEWER CUSTOMERS BEING INTERRUPTED?

A. Yes, but these configuration changes come at a cost, and there may be other limitations as well. Some of these limitations include the ability to obtain planned outages to execute the portfolio. During these planned outages, local generation such as the planned New Orleans Power Station will be needed to ensure and support system reliability. Significant coordination between Transmission and other involved entities including ENO's distribution organization (i.e., engineering, planning, operations, customer service, etc.), the customers, MISO, and Entergy's power generation organization will be paramount. For example, the distribution system may require modifications (e.g., building additional distribution circuits) to move customers around to be served from alternate points of delivery while a substation outage is undertaken to perform the required projects. Customers normally served from multiple transmission sources may be limited to a single source furthering their exposure to outages. MISO will need to review and approve planned transmission outages. Power generation will need to review the local generation commitment and dispatch to support the planned transmission outages. Furthermore, planned outages are still subject to cancellation by MISO if system conditions are warranted. During

this period of planned outages, customers will be subject to an increased exposure to service disruptions.

As discussed previously where I described the design of the transmission system and the various types of substation configurations, the design inherently impacts the level of system reliability. Building and upgrading transmission facilities to comply with NERC reliability standards not only provide for continued system reliability but also added transmission system capacity that will aid in obtaining the necessary outages to perform the asset management projects. While the Company is still evaluating its options, the opportunities to improve ENO's transmission system reliability include (i) addressing legacy configuration vulnerabilities, (ii) enhancing ENO's asset renewal programs by replacing obsolescent or end-of-life transmission system components, and (iii) leveraging transformation technologies such as gas-insulated substations.

Q32. BASED ON THE INFORMATION PRESENTED ABOVE, WHAT IS YOUR OPINION OF ENO'S TRANSMISSION SYSTEM PERFORMANCE IN 2018?

A. The data show that while ENO's transmission system performance in three out of the last five years is in the second quartile, such performance has not been consistent. Through the end of 2018, transmission events accounted for approximately 28% of ENO customer-view interruptions from both transmission and distribution events. The decline in reliability performance in 2018 does not meet ENO's expectations.

Q33. WHAT ARE THE KEY EVENT DRIVERS FOR THE TRANSMISSION OUTAGE EVENTS FOR THE 2014-2018 PERIOD?

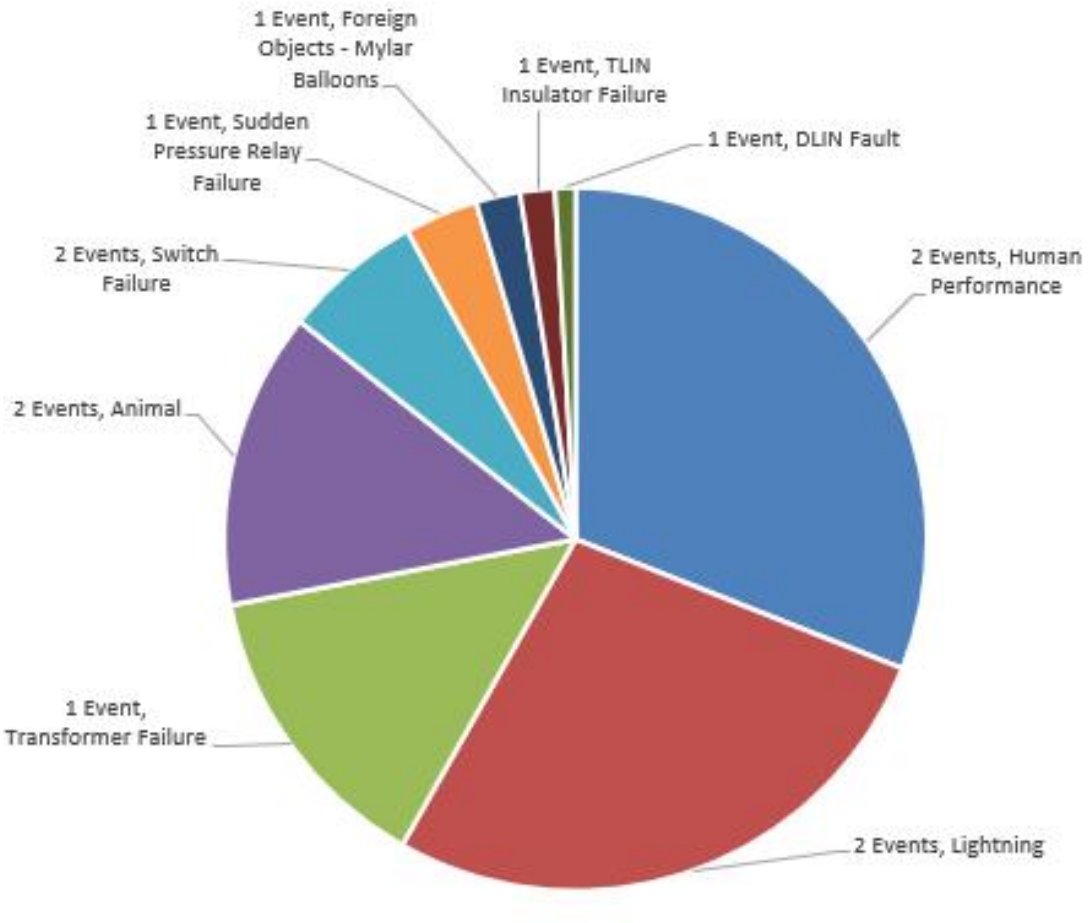
A. As presented in the chart below, asset condition accounts for 70%, system configuration accounts for 19%, and human performance accounts for 11%. Asset condition refers to events caused by equipment failure or animals. System configuration refers to events that impact customers due to the configuration of the system. For example, a lightning strike on a transmission line would impact customers served by a substation not protected by transmission-voltage breakers. If the substation had transmission-voltage breakers, the breakers would have isolated the effect of the lightning strike and those customers would not have been impacted. Human performance is any sustained event due to human action including, but not limited to, switching errors, relay setting errors, and design errors. For 2018, the statistics are as follows:

- Asset Condition: 39%
- System Configuration: 30%
- Human Performance: 31%

Q34. PLEASE DESCRIBE THE CAUSES OF THE 13 TRANSMISSION-RELATED EVENTS IN 2018.

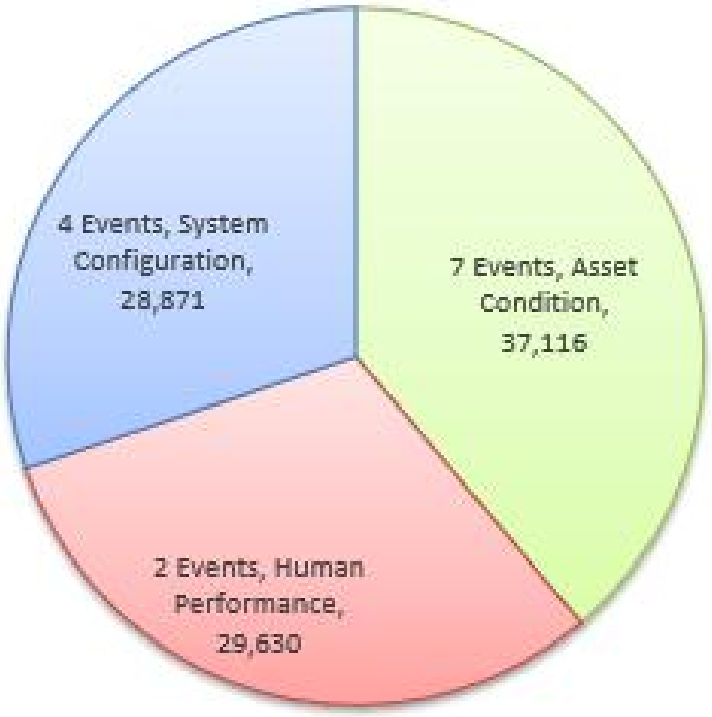
A. See the chart below for the detailed cause classifications and the number of events attributed to them.

Chart 2.
ENO Customer Interruption Events (2018)



As noted previously, the detailed causes can be grouped into three broad categories (asset condition, system configuration, and human performance) depicted in the chart below. These categories are the target areas for ENO's planned roadmap to reduce customer interruptions.

Chart 3.
ENO Customer Interruptions by Roadmap Target Area (2018)



Q35. GIVEN THE RECENT INCREASE IN TRANSMISSION-RELATED OUTAGES, WHAT ACTIONS HAS ENO UNDERTAKEN?

A. ENO has undertaken a number of actions that include (1) reviewing and updating the assets that are candidates for renewal, (2) began executing the current reliability plan, which includes $25 million of asset renewal projects over five years (2019-2023), (3) adding transmission-voltage circuit breakers at key substations to reduce customer exposure, (4) increasing maintenance activities over recent months, (5) evaluating additional technologies that may lead to proactive identification of impending

equipment problems, and (6) actions to eliminate identified human performance traps.[10]

Q36. WHAT IS ENO'S CURRENT RELIABILITY-FOCUSED CAPITAL INVESTMENT PLAN AND DOES IT ADDRESS THE RELIABILITY ISSUES IDENTIFIED?

A. ENO's current reliability-focused capital investment plan revolves around preventing outages based on the main categories discussed previously: asset condition and system configuration. This plan includes increased spending in 2019 and 2020 to complete additional projects that will address system configuration challenges, as well as asset renewal work that is continuing to increase over the next several years.

This plan includes a review of all ENO substations to identify all components that would qualify for replacement under an asset renewal program. It also identifies the system configuration vulnerabilities that would need to be addressed in order to bring the system to a level commensurate with current Entergy Transmission design standards. These items are prioritized and identified in the plan for execution consistent with the criteria and description of the prioritization framework described above.

[10] Human performance traps are the circumstances that can cause a person to be involved in an unplanned event due to a reduced level of awareness.

Q37. ARE THERE OTHER EFFORTS UNDERWAY?

A. As mentioned previously, all ENO substations have been reviewed to identify the asset renewal opportunities, as well as system configuration vulnerabilities. These are continuing to be reviewed and prioritized, along with potential budgetary impacts, in order to present opportunities for significant improvements in the reliability of the ENO system. These investment opportunities aim to (i) reduce the number of events experienced and the magnitude of the impacts to customers from events when they do occur, and (ii) provide greater control over the variability in performance year-to-year.

Additionally, comprehensive inspections of ENO's transmission lines are being planned in order to perform a similar evaluation of all components that make up our transmission line assets (e.g., insulators, poles and structures, static wires, etc.). This review is expected to produce a similar extensive capital plan to ensure components in a degraded condition are identified and prioritized for replacement.

Q38. ARE YOUR RELIABILITY PROGRAMS SIMILAR TO THOSE USED BY OTHERS IN THE INDUSTRY?

A. Yes, and we are continually evaluating our reliability programs to identify potential gaps. This evaluation is generally completed in two parts: (1) an ongoing review of our reliability performance data for evolving trends; and, (2) benchmarking with other utilities of a similar size and makeup. These evaluations are ongoing efforts to identify opportunities to strengthen our reliability programs and thus the overall reliability of the ENO system.

Q39. WHAT IS THE EXPECTED IMPACT TO ENO'S TRANSMISSION SYSTEM RELIABILITY DUE TO ONGOING AND PLANNED EFFORTS?

A. Given the current investment plan and based on the description of the challenges faced by ENO's transmission system, system reliability is expected to continue at a level consistent with recent years' performance. That is, on average, the system would be expected to provide second quartile performance over the span of multiple years; however, system performance is subject to significant variability on a year-to-year basis.

IV. CONCLUSION

Q40. BASED ON YOUR EXPERIENCE WITH ELECTRIC TRANSMISSION SYSTEMS AND, SPECIFICALLY WITH LOUISIANA TRANSMISSION GRID OPERATIONS AND MAINTENANCE, DO YOU BELIEVE THAT ENO HAS ACTED REASONABLY AND PRUDENTLY IN MANAGING THE RELIABILITY OF ITS TRANSMISSION SYSTEM AND IN ADDRESSING THE RECENT INCREASE IN TRANSMISSION-RELATED OUTAGES?

A. Yes. ENO believes it has acted reasonably and prudently in managing the reliability of its transmission system, especially given the inherent vulnerabilities of legacy design and configuration of the transmission system, by generally maintaining second quartile performance while attempting to balance cost with customer reliability. ENO has addressed broader system needs through the construction of transmission capital investments to comply with NERC reliability standards, while awaiting the planned

construction of the New Orleans Power Station. These projects provide the backbone reliability needed for the system to perform the other projects identified through the Company's infrastructure reliability plan.

As noted herein, to address the 2018 increase in transmission-related outages, ENO has undertaken a number of actions that include (1) reviewing and updating the assets that are candidates for renewal, (2) began executing the current reliability plan, which includes $25 million of asset renewal projects over five years (2019-2023), (3) adding transmission-voltage circuit breakers at key substations to reduce customer exposure, (4) increasing maintenance activities over recent months, (5) evaluating additional technologies that may lead to proactive identification of impending equipment problems, and (6) actions to eliminate identified human performance traps.

Q41. DOES THIS CONCLUDE YOUR DIRECT TESTIMONY?

A. Yes, at this time.

AFFIDAVIT

STATE OF LOUISIANA

PARISH OF ORLEANS

NOW BEFORE ME, the undersigned authority, personally came and appeared, **William L. Sones**, 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.

William L. Sones

SWORN TO AND SUBSCRIBED BEFORE ME
THIS 8th DAY OF JANUARY, 2019.

NOTARY PUBLIC

My commission expires: at death

TIMOTHY S. CRAGIN
NOTARY PUBLIC (La. Bar No. 22313)
Parish of Orleans, State of Louisiana
My Commission is issued for Life

NOTARY PUBLIC ID # 58749