# EXECUTIVE SUMMARY

The Company's 2026-2028 T&D SRP aims to strengthen the Company's transmission and distribution system to maintain reliable service for its customers during Resiliency Events. The SRP contains thirty-nine (39) Resiliency Measures. As the Vice President of Distribution Operations and Service Delivery, I am responsible for five (5) Resiliency Measures related to the overhead portions of the Company's distribution system.

These five Resiliency Measures are intended to mitigate the impact of wind events (e.g., hurricanes, tropical storms, and major storms), extreme temperatures, and wildfires on the Company's transmission and distribution system through a combination of hardening, modernization, and wildfire risk mitigation. As summarized in Figure DT-1 below, the five Resiliency Measures that are related to the overhead portions of the Company's distribution system will cost approximately $1,020.8 million in capital costs and $6.6 million in incremental O&M expense from 2026-2028.

## Figure DT-1

**Overhead-Related Resiliency Measures Estimated Costs and CMI (in millions)**

| Resiliency Measure | Resiliency Event to be Mitigated | T&D SRP Rule Category | Estimated Capital Costs 2026-2028 | Estimated O&M Costs 2026-2028 | Estimated Total Costs 2026-2028 | Estimated CMI Savings |
|---|---|---|---|---|---|---|
| Distribution Circuit Resiliency (RM-1) | Hurricane<br>Tropical storm<br>Major storm<br>Wind event<br>Physical damage by third parties | Hardening | $513.4 | None | $513.4 | 263.0 |
| Restoration | Hurricane | Modernization | $107.3 | $0.5 | $107.8 | 97.0 |

| Resiliency Measure | Resiliency Event to be Mitigated | T&D SRP Rule Category | Estimated Capital Costs 2026-2028 | Estimated O&M Costs 2026-2028 | Estimated Total Costs 2026-2028 | Estimated CMI Savings |
|---|---|---|---|---|---|---|
| IGSD (RM-3) | Tropical storm Major storm Wind event Physical damage by third parties | | | | | |
| Distribution Pole Replacement and Bracing (RM-4) | Hurricane Tropical storm Major storm Wind event Physical damage by third parties | Hardening | $251.6 | None | $251.6 | 121.0 |
| Load Shed IGSD (RM-15) | Hurricane Tropical storm Major storm Wind event Physical damage by third parties | Modernization | $4.5 | $0.1 | $4.6 | N/A* |
| Contamination Mitigation (RM-20) | Drought | Modernization | $144.0 | $6.0 | $150.0 | 15.7 |
| **Total** | | | **$1,020.8** | **$6.6** | **$1,027.4** | **496.7** |

The Resiliency Measures above are anticipated to save approximately 497 million minutes in CMI. The Company will utilize its well-established processes to ensure the Company has sufficient Company personnel and material to implement the Resiliency Measures. The Company can and will augment and increase manpower, typically through the staffing of additional external contractors, if needed.

# I. INTRODUCTION

**Q. PLEASE STATE YOUR NAME AND CURRENT POSITION.**

A. My name is Deryl Tumlinson. I am the Vice President of Distribution Operations and Service Delivery for the Company.

**Q. PLEASE SUMMARIZE YOUR EDUCATIONAL AND WORK EXPERIENCE.**

A. I hold a bachelor's degree in business administration from LeTourneau University. I began my career in August 1983 with Houston Lighting & Power, a CNP predecessor company. Since that time, I have been employed by CNP or one of its affiliates. My positions within the Company and predecessor companies have included Power Plant Operator, Service Consultant, Service Area Supervisor, Service Area Director, Business Transformation Director, Major Underground Operations Director, and Regional Operations Director. I was named to my present position in March 2023, at which time I assumed responsibility for the Company's electric distribution operations.

**Q. WHAT ARE YOUR CURRENT RESPONSIBILITIES AT CNP?**

A. As Vice President of Distribution Operations and Service Delivery, I oversee the Company's electric distribution operations, which entails delivering electricity to the Company's approximately 2.8 million metered residential, commercial, and industrial customers throughout the Greater Houston area. The two organizations of (1) Distribution Operations and Service Delivery and (2) MUG and Distribution Modernization have approximately 1,180 employees combined that are responsible for design, construction, maintenance, and service restoration of the Company's

distribution system. Additionally, the two organizations manage approximately 1,500 external contractors that provide design, construction, maintenance, and power restoration services to the Company. The MUG and Distribution Modernization team is overseen and discussed by Company witness Randy Pryor.

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

A. I am testifying on behalf of the Company.

**Q. HAVE YOU TESTIFIED PREVIOUSLY?**

A. Yes. I have filed testimony regarding the recovery of May 2024 storm costs in Docket No. 57271, the Company's DCRF proceedings in Docket Nos. 57385 and 55993, the Company's AMS reconciliation filings in Docket Nos. 38339, 42084, and 47364, and the Company's base rate proceeding in Docket No. 56211.

**Q. WHAT EXHIBITS HAVE YOU INCLUDED WITH YOUR TESTIMONY?**

A. I have included the one exhibit listed in the Table of Contents as part of my testimony.

**Q. WAS YOUR TESTIMONY PREPARED BY YOU OR BY OTHERS WORKING UNDER YOUR DIRECTION AND CONTROL?**

A. Yes.

## II. OVERVIEW OF TESTIMONY

**Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY AND HOW IS IT ORGANIZED?**

A. There are six operations witnesses – Mr. David Mercado, Mr. Randy Pryor, Mr. Eric Easton, Mr. Ronald Bahr, Mr. Christopher Ford, and me – addressing the following subjects.

**Figure DT-2**

**Operations Witnesses and Corresponding Testimony Subjects**

| Witness | Subject of Testimony |
|---|---|
| **Mr. Deryl Tumlinson** | **Overhead Distribution System** |
| Mr. David Mercado | Transmission System and Substations |
| Mr. Randy Pryor | Strategic Undergrounding and Vegetation Management |
| Mr. Eric Easton | Damage Prediction, Use of Advanced Analytics, and Wildfire Mitigation |
| Mr. Ronald Bahr | Information Technology |
| Mr. Christopher Ford | Cybersecurity Operations |

My testimony provides a general overview of the Company's Distribution Operations and Service Delivery team, the distribution system itself, and the day-to-day activities conducted by the Company to ensure safe and reliable service to the customers and communities that the Company has the privilege to serve. I explain the role of the Distribution Operations and Service Delivery team during a Resiliency Event and the Company's storm restoration process. I then briefly describe the Resiliency Measures in the Company's 2026-2028 T&D SRP that are related to overhead distribution operations.

## III. DISTRIBUTION OPERATIONS AND RESILIENCY

**Q. PLEASE DESCRIBE THE DISTRIBUTION SYSTEM THAT SERVES THE CUSTOMERS IN THE COMPANY'S SERVICE AREA.**

A. The Company's distribution system is comprised of approximately 58,000 miles of overhead and underground distribution lines, streetlights, and associated equipment such as step-down transformers, insulators, capacitors, and fuses. Additionally, CNP and the Company have general information technology infrastructure that

provides the back-office support functions needed to provide distribution service to customers.

**Q. PLEASE DESCRIBE THE COMPANY'S PERSONNEL THAT WORKS ON THE DISTRIBUTION SYSTEM.**

A. There are two teams that work on the Company's distribution system: (1) Distribution Operations and Service Delivery and (2) Major Underground (MUG) and Distribution Modernization. The Distribution Operations and Service Delivery and MUG and Distribution Modernization teams comprise of approximately 1,180 employees responsible for design, fieldwork (e.g., maintenance and installation), and service restoration on the Company's distribution system.

**Q. DOES THE COMPANY USE EXTERNAL CONTRACTORS TO ASSIST ITS DISTRIBUTION WORKFORCE?**

A. Yes. The Distribution Operations and Service Delivery and MUG and Distribution Modernization teams manage approximately 1,500 external contractors that provide design, fieldwork (e.g., maintenance and installation), and power restoration services.

**Q. WERE THE DISTRIBUTION OPERATIONS AND SERVICE DELIVERY TEAM, MUG AND DISTRIBUTION MODERNIZATION TEAM, AND EXTERNAL CONTRACTORS INVOLVED IN THE EXECUTION OF PHASE ONE AND PHASE TWO OF THE GHRI?**

A. Yes. The Distribution Operations and Service Delivery team, MUG and Distribution Modernization team, and external contractors managed by the teams were involved in the planning, execution, and oversight for completion of Phase

One of the GHRI and continue to be involved in executing Phase Two of the GHRI.

**Q. WILL THE DISTRIBUTION OPERATIONS AND SERVICE DELIVERY, TEAM MUG AND DISTRIBUTION MODERNIZATION TEAM, AND EXTERNAL CONTRACTORS BE INVOLVED IN IMPLEMENTING THE DISTRIBUTION SYSTEM-RELATED RESILIENCY MEASURES IN THE 2026-2028 T&D SRP?**

A. Yes.

**A. Day-to-Day Activities**

**Q. PLEASE DESCRIBE THE DAY-TO-DAY ACTIVITIES CONDUCTED BY THE DISTRIBUTION OPERATIONS TEAM TO MAINTAIN AND OPERATE THE DISTRIBUTION SYSTEM FOR ITS CUSTOMERS AND THE COMMUNITIES IT HAS THE PRIVILEGE TO SERVE.**

A. The Company's day-to-day distribution operations can be generally categorized into the following six (6) activities:

- Inspection and maintenance of distribution equipment and facilities that serve existing customers;
- Repairs to or replacement of distribution equipment and facilities that are damaged, compromised, or not functioning;
- Upgrades to existing distribution equipment and facilities;
- Design, construction, installation, or reconfiguration of new distribution equipment and facilities to serve new and existing customers;
- Vegetation management (proactive tree trimming, reactive tree trimming, hazard tree removal, emergency, and post-storm activities); and

- Restoration of service to customers after an outage.

**Q. DO THESE ACTIVITIES SUPPORT THE RESILIENCY OF THE COMPANY'S DISTRIBUTION SYSTEM?**

A. Yes. The Company's distribution system, particularly its overhead distribution facilities, is exposed to the elements. It is susceptible to both wear-and-tear and damage caused by third parties (e.g., damage from a vehicle collision). The six activities above, which are both proactive and reactive, ensure that the Company's distribution system is better situated to withstand Resiliency Events, which are typically extreme weather events. Examples of each activity are described further below.

**Q. DOES THE COMPANY CONDUCT REGULAR INSPECTIONS OF ITS DISTRIBUTION SYSTEM?**

A. Yes. The Company has over 1 million distribution poles on its distribution system, of which approximately 98% are wooden poles.[1] The Company's pole inspection program is considered best in class, according to an independent, third-party report.[2] The Company inspects wooden distribution poles on a 10-year cycle, meaning approximately 10% or 100,000 of the Company's wooden distribution poles are inspected annually. Inspections involve an 18-step process that includes a visual inspection and manual excavation to assess any decay below the ground

[1] The Company's distribution poles consist of the following materials: (1) wood (approximately 1,000,229); (2) fiberglass (approximately 12,526); (3) steel (approximately 6,121); (4) concrete (approximately 2,338); and (5) ductile iron (approximately 1,013). Additionally, the Company has distribution equipment on over 143,000 poles owned by third parties, such as telecommunications providers.

[2] *Subject Matter Expert Report Related to CenterPoint Energy Wood Pole Asset Management*, Nelson Research (July 22, 2024).

line and boring/sounding to locate internal voids. Distribution poles of sufficient strength remain in service until the next scheduled inspection and are treated with a preservative paste (or with a fumigant, as necessary) and tagged. Supporting guy wires, strains, and anchors are also inspected as part of the distribution pole inspection process.

Also, outside of the normal inspection cycle, Company personnel and external contractors are in the field daily. These individuals are trained to observe the condition of distribution facilities and equipment and report any unusual conditions that may require corrective action by the Company.

**Q. WILL THE COMPANY AMEND ITS INSPECTION PROCESS AS MORE NON-WOODEN DISTRIBUTION POLES ARE INSTALLED ON THE COMPANY'S DISTRIBUTION SYSTEM?**

A. Yes. Currently, the Company conducts visual inspections of non-wooden distribution poles and any supporting guy wires, strains, and anchors. As more non-wooden distribution poles are installed on the Company's distribution system, as contemplated in the Company's SRP, the Company's inspection process for distribution poles may be amended to ensure that there is a process that addresses the frequency of inspection for non-wooden distribution poles, the standard under which non-wooden distribution poles are inspected, and the criteria for replacement of non-wooden distribution poles.

**Q. HOW DOES THE COMPANY EVALUATE WHETHER A WOODEN DISTRIBUTION POLE NEEDS TO BE REPAIRED OR REPLACED?**

A. In determining whether a wooden distribution pole needs to be repaired or replaced,

the Company follows the minimum remaining strength requirements outlined in the NESC. The NESC requires structures of various materials to be replaced or rehabilitated when deterioration reduces the pole's structural integrity by a pre-determined percentage of its original strength when installed. The Company has pre-determined criteria to determine whether a pole should be replaced or can be considered for trussing. For distribution poles that have a remaining pole strength below the NESC standard, the Company evaluates the possibility of trussing. Otherwise, the distribution pole will be replaced.

**Q. WHAT IS TRUSSING?**

A. Trussing is the practice of restoring or strengthening a wooden distribution pole that has been weakened by decay or physical damage by bracing the pole with a metal truss. A metal truss allows the transfer of load that would otherwise be borne by the weakened pole. For example, wind loading causes a pole to bend. For a pole that does not have a metal truss, the wind loading would be borne by the pole, causing further stress to portions of the pole that have been weakened or damaged. In contrast, a pole with a metal truss would have the wind loading transferred to the metal truss.

**Q. WILL THE COMPANY TRUSS WOODEN DISTRIBUTION POLES AS PART OF THE COMPANY'S SRP?**

A. Yes. As part of the Distribution Pole Replacement and Bracing Resiliency Measure, the Company will truss wooden distribution poles that are identified as suitable for trussing. Please note that the trussing proposed by the Company will strengthen, as opposed to restoring, the distribution pole that is trussed.

**Q. DOES THE COMPANY HAVE EXPERIENCE IN UPGRADING ITS EXISTING DISTRIBUTION SYSTEM?**

A. Yes. The Company has experience in upgrading its existing distribution system. For example, the Company has extensive experience in rebuilding, upgrading, and hardening distribution circuits to meet NESC Rule 250C and Rule 250D standards related to wind and ice loading. Rebuilding distribution circuits has consisted of upgrading wooden poles or replacing wooden distribution poles with non-wood distribution poles (e.g., fiberglass, concrete or ductile iron), hardening substation getaways (i.e., the underground connection between a substation and a distribution circuit), replacing or upgrading crossarms, and upgrading conductors to a higher ampacity.

Another example of the Company upgrading (and modernizing) its distribution system is the installation of IGSDs on select locations of the distribution system. IGSDs are an interruption device that may be operated automatically or remotely as an intelligent switch or recloser. IGSDs assist customer service restoration efforts by mitigating the impact that a sustained fault has on a circuit and its customers. A sustained fault is a fault that short circuits a distribution circuit for a sufficient length of time that interrupts service to customers behind the electrical protection devices up to and including the lock-out of the substation breaker. IGSDs may be automatically or remotely operated to isolate/sectionalize faulted distribution circuit segments and allow for the rerouting of power to restore service to customers on un-faulted distribution circuit segments. Additionally, IGSDs provide information that allow the Company to identify a fault

more quickly (versus having to manually inspect each circuit) and efficiently deploy Company resources for customer power restoration efforts. Figure DT-3 below summarizes the amount spent, in millions, by the Company on distribution system hardening and IGSD installation from 2020-2023.

**Figure DT-3**

**2020-2023 Investments in Distribution System Hardening and IGSDs (in millions)**

| Description | 2020 | 2021 | 2022 | 2023 | Total |
|---|---|---|---|---|---|
| IGSD Installation | 1 | 5 | 12 | 13 | $31 |
| Distribution Pole Replacement/Bracing | 29 | 30 | 61 | 52 | $172 |
| Distribution Circuit Resiliency | - | - | 40 | 40 | $80 |
| Distribution Resiliency - TripSaver | - | - | 7 | 5 | $12 |
| **Total 2020 - 2023** | **$30** | **$35** | **$120** | **$110** | **$295** |

The Company's prior investments in rebuilding distribution circuits and replacing distribution poles has hardened portions of the distribution system against extreme weather events. Additionally, the Company's prior investments in automation (e.g., IGSDs and TripSavers) have provided benefits to customers by saving approximately 665 million outage minutes during 2024 Resiliency Events, including the Derecho on May 16, 2024, the May 28, 2024 storm, and Hurricane Beryl. The Company's prior investments in automation translate to an outage duration reduction of nearly four hours for every customer. The Company anticipates that the Distribution Circuit Resiliency and Distribution Pole Replacement and Bracing Resiliency Measures will provide continued customer benefits by further hardening the distribution system against extreme weather events. Similarly, the Company anticipates that the Restoration IGSD, Load Shed

IGSD, and Wildfire IGSD Resiliency Measures will likewise provide additional benefits to customers by saving approximately 97.0 million minutes in CMI. Mr. Eric Easton discusses the Wildfire IGSD Resiliency Measure in more detail.

**Q. IN HARDENING ITS DISTRIBUTION SYSTEM, HAS THE COMPANY ADOPTED HIGHER DESIGN STANDARDS?**

A. Yes. For example, beginning in 2022, the Company implemented higher design standards when designing, constructing, and installing new distribution equipment and facilities. The Company has adopted the NESC 250C and 250D standards related to wind and ice loading for all new distribution structures, regardless of height.[3] Additionally, beginning in 2022, the Company used a special tangent pole framing for new or replacement construction in areas that have been designated as being at risk of galloping conductors.

**Q. PLEASE DESCRIBE THE COMPANY'S VEGETATION MANAGEMENT PROGRAM RELATED TO THE DISTRIBUTION SYSTEM.**

A. The Company's distribution system vegetation management program has four (4) components:

- Scheduled vegetation maintenance (proactive tree trimming): Proactive tree trimming is the largest component of the Company's vegetation management program for the distribution system. Each distribution circuit is prioritized for trimming based on the circuit's trim cycle and reliability (i.e., SAIDI and SAIFI). A circuit's trim cycle is dependent on factors such as: last trim date,

[3] Prior to 2022, the Company applied NESC 250C and 250D for distribution structures that were 60 feet above ground level.

vegetation-caused outages, potential impact on critical loads served by the circuit, and overall customer count.

- Unscheduled vegetation maintenance (reactive tree trimming): Reactive tree trimming is conducted to address vegetation issues that require immediate attention.
- Tree risk management (proactive hazard tree removal): The Company identifies vegetation outside of the Company's right-of-way that may pose a risk to distribution facilities. With consent from landowners, the Company trims trees located outside of the Company's right-of-way to mitigate the risk of falling trees impacting the Company's distribution system.
- Emergency and post-storm activities: The Company conducts vegetation management if needed to assist in customer power restoration efforts after an extreme weather event or major storm.

Mr. Randy Pryor discusses the Company's vegetation management strategy and operations in more detail.

**Q. HOW DOES THE DISTRIBUTION OPERATIONS TEAM PREPARE FOR DAY-TO-DAY STORMS AND RESTORATION?**

A. Preparation and restoration are proportional to the intensity of a forecasted storm and potential impact. To prepare for storms, the Company uses commercial and public weather sources and the Company meteorologist to monitor and forecast weather. The information collected from these sources allows the Company to estimate potential damage, plan for any necessary restoration resources, calculate restoration timeframes, and allocate resources and personnel as needed. As a storm

occurs, the Company constantly re-evaluates its resources needed to meet its customer restoration objectives. The Distribution Operations team's preparations for and response to Resiliency Events is discussed below.

**B. Preparing for and Responding to Resiliency Events**

**Q. HOW DO RESILIENCY EVENTS TYPICALLY IMPACT THE COMPANY'S OVERHEAD DISTRIBUTION FACILITIES?**

A. The Resiliency Events that typically affect the Company's overhead distribution facilities are extreme weather events, particularly those events with high winds. For example, the Greater Houston area experiences major storms and wind events in which vegetation and debris, from inside and outside the Company's right-of way, collide with and cause damage to the Company's distribution facilities.

**Q. DOES THE COMPANY MONITOR PRESENT AND FORECASTED WEATHER CONDITIONS IN THE GREATER HOUSTON AREA?**

A. Yes. The Company utilizes commercial sources (i.e., StormGeo), public sources (e.g., National Weather Service, National Hurricane Center), and a Company employed meteorologist to monitor the weather, including storm forecasts.

**Q. FOR A STORM THAT IS FORECASTED TO AFFECT THE GREATER HOUSTON AREA, HOW DOES THE COMPANY PREPARE IN ADVANCE OF THE STORM?**

A. The Company prepares for storms in a few ways. First, CNP and Company employees have defined roles when the Company activates its EOP. CNP and Company employees receive annual EOP training and conduct annual EOP drills. Second, from an organizational perspective, the Company utilizes the ICS, which

is a standardized and widely used approach to efficiently coordinate emergency response activities. CNP and Company leaders undergo annual ICS-related training. Third, to the extent that the Company is able to do so, the Company reconfigures distribution circuits to mitigate the number of customer outages and proactively conducts vegetation management. For example, in preparation for and to mitigate the potential impacts of Hurricane Francine that made landfall on September 11, 2024, the Company had approximately 1,300 vegetation management workers that trimmed trees and removed higher-risk vegetation. Fourth, the Company prepares in advance, including by procuring the necessary manpower and materials for post-storm customer restoration efforts. For a storm that is forecasted to affect the Greater Houston area, the Company gathers and reviews weather data based upon the storm's current location to determine the projected path and intensity of the storm, rainfall amounts, lightning activity, and sustained and gust wind speeds. Based on this information, the Company predicts the impact of the storm on its service area, which in turn determines both the personnel and resources needed to repair damaged infrastructure and restore service to our customers. Using Hurricane Francine again as an example, the Company had approximately 2,350 linemen (1,850 local linemen and 500 mutual assistance linemen) on standby. Finally, after a weather event has left our service area and when it is safe to do so, vehicles, equipment and personnel (e.g., Company employees, native contractors, mutual assistance partners, and other contractors) are then deployed to conduct damage assessments and perform service restoration efforts. Additional details on this process for wind events are provided in Appendix

A of the SRP.

**Q. AFTER A STORM OR SEVERE WEATHER EVENT, HOW DOES THE COMPANY PRIMARILY ASSESS DAMAGE TO ITS DISTRIBUTION SYSTEM?**

A. As previously stated, the Company's preparation and restoration efforts are proportional to the forecasted impact of a storm or severe weather event. The Company commits significantly more resources towards preparing, responding, and dedicating personnel to a Resiliency Event, such as a major storm that affects all or a portion of the Greater Houston area, than those preparations for and response to a more localized storm that brings routine rain and winds.

After a major storm or severe weather event, and when it is safe to do so, the Company begins to assess damage to its distribution system in two ways. First, line crews (i.e., Company employees, native contractors, mutual assistance partners, and other contractors) are dispatched to manually restore service and to simultaneously assess damage during this restoration effort. The line crews use a mobile application called Service Suite to input assessed damage that the line crews will restore. The damage identified by line crews is typically downed poles and conductors and damage to equipment (e.g., capacitor bank, transformer bank, IGSDs). The damage identified by the line crews also helps the Company further determine and allocate the resources needed to restore service and is used to refine the estimated time for its customer restoration efforts.

Second, the Company assigns damage assessors to specific distribution

circuits to assess damage.[4] Damage assessors use the Company's Damage Assessment Mobile Application, which allows the assessor to:

- Use GIS mapping to patrol the assigned circuit,
- Collect and report information, and
- Input notes and images of damage.

Damage assessors use the Company's Damage Assessment Mobile Application to electronically submit damage assessment surveys that provide information such as:[5]

- Site accessibility and location of identified damage (e.g., street, backyard, easement),
- Conductors (e.g., primary) and number of spans that are down,
- Necessity of tree trimming or vegetation removal,
- Type, size, and number of poles involved,
- Framing type,
- Type, size, and number of transformers involved and accessibility of the transformer(s),
- Equipment that has been damaged, and
- Presence of third-party equipment (e.g., telecommunications equipment).

Damage assessment surveys are compiled and reviewed through the

[4] In certain instances, including areas that are difficult to access, the Company may conduct aerial inspections using helicopters or unmanned aerial vehicles.

[5] To the extent that a damage assessor is unable to utilize the Company's Damage Assessment Mobile Application, the damage assessor will notate identified damage on printed maps of specific portions of the Company's distribution system. The damage assessor will relay the assessment to personnel that subsequently inputs the identified damage into the Company's internal dashboard.

Company's internal dashboard. Upon completion of the damage assessment of an entire circuit, restoration work packets are then sent to operations personnel to perform customer restoration efforts.

**Q. PLEASE GENERALLY DESCRIBE THE COMPANY'S RESTORATION PROCESS AFTER A STORM.**

A. Generally, the Company's priority is to restore power to distribution circuits that serve critical loads,[6] including circuits that serve critical health and human services, public safety facilities such as hospitals, fire stations, police stations, and water treatment facilities, and the highest number of customers. The Company uses the following restoration sequence: (1) circuit/section level restoration, including "cut and clear;" (2) fuse level restoration; (3) transformer level restoration; and (4) restoration of single customer outages.

**Q. WHAT IS THE CUT AND CLEAR PHASE?**

A. "Cut and clear" refers to the process by which line crews work to identify damage to distribution circuits, primarily damage to poles and conductors. Under the cut and clear process, line crews are assigned to certain locations, and beginning at the substation, line crews "walk the circuit" to identify damage to specific infrastructure or equipment and the cause of customer outages. Damage is isolated, remotely by distribution control or manually by the line crews, to enable service restoration to the customers that are served by the un-faulted portion of the distribution circuit. Once the segment or circuit is isolated and the un-faulted

[6] Based on input from cities and county offices of emergency management, the Company has pre-determined priority distribution circuits.

portion of the circuit is energized, crews proceed to the next assigned circuit, performing similar activities to restore service to as many customers on un-faulted portions of circuits as possible. The faulted section of the feeder is referred to a crew with the proper skillsets and equipment to repair. This process repeats until all the circuit level outages have been addressed.

## IV. WORK ORDERS

**Q. HOW DOES THE COMPANY CREATE AND IMPLEMENT WORK ORDERS?**

A. As discussed further by Mr. Nathan Brownell, the Company has well-established processes that ensure the Company has sufficient personnel and material to implement work orders for construction, installation, and replacement projects. Work orders are created by internal and contract personnel utilizing SAP and a software program called Distribution Design Studio. The work orders are reviewed and approved by Company leadership and assigned to appropriate crews for completion. The Company uses an SAP work management software to track each project on a work order basis. Service consultants, engineers, and contract designers are responsible for creating work orders based on design and load specifications. They are trained on work order creation, including specification of what defines capital work versus non-capital work and correct coding of work orders.

## V. OVERHEAD DISTRIBUTION SYSTEM-RELATED RESILIENCY MEASURES

**Q. PLEASE DESCRIBE THE RESILIENCY MEASURES RELATED TO THE COMPANY'S OVERHEAD DISTRIBUTION SYSTEM THAT YOU ARE PROVIDING TESTIMONY ON.**

A. There are fifteen (15) distribution system-related Resiliency Measures in the Company's SRP. I am testifying on the five (5) Resiliency Measures that are related to the overhead portions of the Company's distribution system. Company witness Randal Pryor is testifying on the five (5) Resiliency Measures that are related to undergrounding, underground modernization, and vegetation management. I would also note Company witness Brad Tutunjian will be providing testimony on the proposed Microgrid Pilot Program, which will involve the Company's distribution system.

**Q. PLEASE SUMMARIZE THE RESILIENCY MEASURES RELATED TO THE OVERHEAD PORTIONS OF THE COMPANY'S DISTRIBUTION SYSTEM.**

A. Figure DT-4 below summarizes the five (5) Resiliency Measures that are related to the overhead portions of the Company's distribution system. These five (5) Resiliency Measures are intended to mitigate the impact of extreme wind events, extreme water events (e.g., hurricanes, tropical storms, flooding, major storms), extreme temperatures (heat, drought, and freezing), and wildfires through a combination of hardening and modernization of the Company's distribution system.

**Figure DT-4**

**Overhead-Related Resiliency Measures Estimated Costs and CMI**
**(in millions)**

| Resiliency Measure | Resiliency Event to be Mitigated | T&D SRP Rule Category | Estimated Capital Costs 2026-2028 | Estimated O&M Costs 2026-2028 | Estimated Total Costs 2026-2028 | Estimated CMI Savings |
|---|---|---|---|---|---|---|
| Distribution Circuit Resiliency (RM-1) | Hurricane Tropical storm Major storm Wind event Physical damage by third parties | Hardening | $513.4 | None | $513.4 | 263.0 |
| Restoration IGSD (RM-3) | Hurricane Tropical storm Major storm Wind event Physical damage by third parties | Modernization | $107.3 | $0.5 | $107.8 | 97.0 |
| Distribution Pole Replacement and Bracing (RM-4) | Hurricane Tropical storm Major storm Wind event Physical damage by third parties | Hardening | $251.6 | None | $251.6 | 121.0 |
| Load Shed IGSD (RM-15) | Hurricane Tropical storm Major storm Wind event Physical damage by third parties | Modernization | $4.5 | $0.1 | $4.6 | N/A |
| Contamination Mitigation (RM-20) | Drought | Modernization | $144.0 | $6.0 | $150.0 | 15.7 |
| **Total** | | | **$1,020.8** | **$6.6** | **$1,027.4** | **496.7** |

**Q. WILL THESE RESILIENCY MEASURES ENHANCE THE RESILIENCY OF THE OVERHEAD PORTIONS OF THE COMPANY'S DISTRIBUTION SYSTEM?**

A. Yes. Grid hardening and automation are well-known and proven within the utility industry to enhance resiliency of a distribution system. The Company has extensive

experience in hardening and automating its distribution system. As it relates to hardening, the Company has made significant investments to harden portions of its distribution system to the Company's current and higher wind (NESC 250C) and ice (NESC 250D) design standards.

**Q. WHAT IS THE DIFFERENCE BETWEEN THE RESTORATION IGSD, LOAD SHED IGSD, AND WILDFIRE IGSD RESILIENCY MEASURES?**

A. All three (3) Resiliency Measures involve the installation of IGSDs. The Load Shed IGSD and Wildfire IGSD Resiliency Measures will involve the installation of IGSDs for a specific function. The Load Shed IGSD Resiliency Measure is intended to mitigate the number of customers, particularly critical loads, impacted by a situation where the Company must shed load at the direction of ERCOT. For critical loads, IGSDs would be installed downstream of the critical load such that the critical load and customers upstream would still receive power during a load shed situation. The Wildfire IGSD Resiliency Measure is intended to mitigate the impact of a wildfire on at-risk circuit sections in the event the Company needs to institute a public safety power shutoff. IGSDs would allow for the isolation/sectionalization of impacted distribution circuits, thereby mitigating the number of customer outages. Note that the IGSDs installed as part of the Load Shed IGSD and Wildfire IGSD Resiliency Measures would also provide the benefit of isolation/sectionalization and faster identification of the fault location.

**Q. DO SALTWATER DEPOSITS IMPACT THE COMPANY'S TRANSMISSION AND DISTRIBUTION SYSTEM?**

A. Yes. Because of the Greater Houston area's proximity to the Gulf Coast, coastal

winds carry salt mist from the ocean that can land on portions of the Company's transmission and distribution system and equipment. Saltwater is a good conductor of electricity. Thus, when saltwater deposits accumulate on the system and equipment, there is potential for the electricity on the conductors to short over the saltwater deposits and go to ground, causing a flashover and resulting in a service interruption.[7]

**Q. HOW DOES THE COMPANY ADDRESS SALTWATER DEPOSITS THAT ACCUMULATE ON PORTIONS OF THE COMPANY'S TRANSMISSION AND DISTRIBUTION SYSTEM ?**

A. The Company power washes affected portions of the Company's transmission and distribution system on an as-needed basis and as conditions require.

**Q. IS THE COMPANY PROPOSING A RESILIENCY MEASURE TO MITIGATE THE IMPACT OF SALTWATER CONTAMINATION?**

A. Yes. Under the Contamination Mitigation Resiliency Measure, the Company proposes to install sensors at select locations to monitor and detect the accumulation of salt deposits on the Company's transmission and distribution system. By proactively monitoring and detecting the accumulation of salt deposits, the Company is better able to take preventive-corrective actions before the accumulation of saltwater deposits affect the operation of the Company's transmission and distribution system for our customers.

[7] A flashover arc is when electricity moves through the air and goes from one conductor to another conductor or ground.

**Q. ARE THE DISTRIBUTION CIRCUIT RESILIENCY, DISTRIBUTION POLE REPLACEMENT AND BRACING, RESTORATION IGSD, LOAD SHED IGSD, AND WILDFIRE IGSD RESILIENCY MEASURES SIMILAR TO THE DISTRIBUTION SYSTEM HARDENING, IGSD INSTALLATION, AND SALTWATER CONTAMINATION MITIGATION PROJECTS BY THE COMPANY FROM 2020-2023?**

A. Yes. Projects related to distribution circuit resiliency, distribution pole replacement and bracing, the IGSD installations for normal circuit segmentation and load shed activities, and saltwater contamination have been implemented during 2020-2023. The Wildfire IGSD is a new initiative for the Company's SRP and is discussed in more detail by Mr. Eric Easton.

## VI. CONCLUSION

**Q. WILL THE RESILIENCY MEASURES IN YOUR TESTIMONY HELP THE COMPANY SERVE ITS CUSTOMERS?**

A. Yes. The 2026-2028 T&D SRP is the next significant step taken by the Company to implement our commitment to the customers and communities it has the privilege to serve. This SRP allows the Company to make the necessary investments in its transmission and distribution system to be the most resilient coastal grid in the country.

**Q. IS IMPLEMENTING THE RESILIENCY MEASURES YOU ARE TESTIFYING ON IN THE PUBLIC INTEREST?**

A. Yes.

**Q. SHOULD THE COMMISSION APPROVE THE COMPANY'S 2026-2028 T&D SRP?**

A. Yes.

**Q. DOES THIS CONCLUDE YOUR DIRECT TESTIMONY?**

A. Yes.

STATE OF Texas §
§
COUNTY OF Harris §

**AFFIDAVIT OF DERYL TUMLINSON**

BEFORE ME, the undersigned authority, on this day personally appeared DERYL TUMLINSON who having been placed under oath by me did depose as follows:

1. "My name is DERYL TUMLINSON. I am of sound mind and capable of making this affidavit. The facts stated herein are true and correct based upon my personal knowledge.

2. I have prepared the foregoing Direct Testimony and the information contained in this document is true and correct to the best of my knowledge."

Further affiant sayeth not.

DERYL TUMLINSON

SUBSCRIBED AND SWORN TO BEFORE ME on this 8th day of January, 2025.

Notary Public in and for the State of Texas

My commission expires: 3/16/2025

PETRA CUSTER
NOTARY ID #12683270-2
My Commission Expires
March 16, 2025

**Exhibit DT-1: Glossary of Acronyms**

| | |
|---|---|
| 2026-2028 T&D SRP or SRP | The Company's 2026-2028 Transmission and Distribution System Resiliency Plan |
| AMS | Advanced Metering System |
| CMI | Customer Minutes Interrupted |
| CNP | CenterPoint Energy, Inc. |
| Company | CenterPoint Energy Houston Electric, LLC |
| Commission | Public Utility Commission of Texas |
| DCRF | Distribution Cost Recovery Factor |
| EOP | Emergency Operations Plan |
| ERCOT | Electric Reliability Council of Texas, Inc. |
| GHRI | The Company's Greater Houston Resiliency Initiative |
| GIS | Geographic Information System |
| ICS | Incident Command System |
| IGSD | Intelligent Grid Switching Device |
| MUG | Major Underground |
| NESC | National Electrical Safety Code |
| O&M | Operations and Maintenance |
| Resiliency Event | An event involving extreme weather conditions, wildfires, cybersecurity threats, or physical security threats that poses a material risk to the safe and reliable operation of the Company's transmission and distribution systems. |
| Resiliency Measure | A measure designed to prevent, withstand, mitigate, or more promptly recover from the risks posed to the Company's transmission and distribution system by a Resiliency Event. |
| SAP | Systems Applications and Products, the Company's enterprise management software system |
| SAIDI | System Average Interruption Duration Index |
| SAIFI | System Average Interruption Frequency Index |

This page was intentionally left blank.

# EXHIBIT 4

# THE DIRECT TESTIMONY OF COMPANY WITNESS MR. DAVID MERCADO

This page was intentionally left blank.

**DOCKET NO. 57579**

| | | |
|---|---|---|
| **APPLICATION OF CENTERPOINT ENERGY HOUSTON ELECTRIC, LLC FOR APPROVAL OF ITS 2026-2028 TRANSMISSION AND DISTRIBUTION SYSTEM RESILIENCY PLAN** | § § § § § | **PUBLIC UTILITY COMMISSION OF TEXAS** |

# DIRECT TESTIMONY OF

# DAVID MERCADO

# ON BEHALF OF

# CENTERPOINT ENERGY HOUSTON ELECTRIC, LLC

**JANUARY 2025**

## TABLE OF CONTENTS

## TABLE OF EXHIBITS

| Exhibit | Description |
|---|---|
| DM-1 | Glossary of Acronyms |

## TABLE OF FIGURES

# EXECUTIVE SUMMARY

The Company's 2026-2028 T&D SRP seeks to strengthen the Company's transmission and distribution system to provide reliable service to its customers during Resiliency Events. The SRP contains thirty-seven (39) Resiliency Measures. As the Vice President of High Voltage and System Operations, I am responsible for thirteen (13) Resiliency Measures related to the Company's transmission system, substations, and control centers. These thirteen Resiliency Measures are intended to mitigate customer outages caused by damage to the transmission system from wind events (e.g., hurricanes, tropical storms, tornados, and major storms), extreme temperature, physical intrusion, and flooding. The Company proposes to implement a variety of Resiliency Measures that harden, modernize, secure, and mitigate risk to the transmission system and substations. Cumulatively, the thirteen Resiliency Measures will cost approximately $2,884.9 million in capital costs and $2.6 million in incremental O&M expense from 2026-2028.

## Figure DM-1

**Transmission System, Substation, and Control Center-Related Resiliency Measures Estimated Costs and CMI (in millions)**

| Resiliency Measure | Resiliency Event to be Mitigated | SRP Rule Category | Estimated Capital Costs 2026-2028 | Estimated O&M Costs 2026-2028 | Estimated Total Costs 2026-2028 | Estimated CMI Savings |
|---|---|---|---|---|---|---|
| Transmission System Hardening (RM-6) | Hurricane<br>Tropical storm<br>Major storm<br>Wind event | Hardening | $1,467.3 | $0.8 | $1,468.0 | 223.8 |
| 69 kV Conversions (RM-7) | Hurricane<br>Tropical storm<br>Major storm | Hardening | $369.3 | None | $369.3 | 65.5 |

| Resiliency Measure | Resiliency Event to be Mitigated | SRP Rule Category | Estimated Capital Costs 2026-2028 | Estimated O&M Costs 2026-2028 | Estimated Total Costs 2026-2028 | Estimated CMI Savings |
|---|---|---|---|---|---|---|
| | Wind event | | | | | |
| S90 Tower Replacements (RM-8) | Hurricane Tropical storm Major storm Wind event | Hardening | $118.4 | None | $118.4 | 59.5 |
| Coastal Resiliency Projects (RM-9) | Hurricane Tropical storm Major storm Wind event | Hardening | $177.4 | $0.8 | $178.1 | 7.8 |
| Substation Flood Control (RM-10) | Flooding High water event | Flood Mitigation | $43.8 | None | $43.8 | 3.9 |
| Control Center Flood Control (RM-11) | Flooding High water event | Flood Mitigation | $7.0 | None | $7.0 | 2.5 |
| Mobile Substations (RM-13) | Hurricane Tropical storm Major storm Wind event | Modernization | $30.0 | None | $30.0 | 3.9 |
| Anti-Galloping Technologies (RM-14) | Hurricane Tropical storm Major storm Wind event | Hardening | $14.0 | $1.0 | $15.0 | 5.3 |
| Distribution Capacity Enhancement/ Substation (RM-16) | Extreme freeze | Modernization | $579.6 | None | $579.6 | 138.1 |
| Substation Fire Barriers (RM-20) | Substation fire | Hardening | $9.0 | None | $9.0 | 1.5 |
| Digital Substation (RM-21) | General Resiliency Events | Modernization | $31.8 | None | $31.8 | 1.2 |
| Substation Physical Security Fencing (RM-26) | Physical intrusion or attack | Physical Security | $18.0 | None | $18.0 | 17.6 |
| Substation Security Upgrades (RM-27) | Physical intrusion or attack | Physical Security | $19.4 | $0.1 | $19.5 | 25.1 |
| **Total** | | | **$2,884.9** | **$2.6** | **$2,887.5** | **555.7** |

The Company will use well-established processes, along with established industry best practices, to ensure that the Company has sufficient personnel and materials to implement the Resiliency Measures. It will augment and increase field crews, typically through the staffing of additional external contractors, if needed.

## I. INTRODUCTION

**Q. PLEASE STATE YOUR NAME AND CURRENT POSITION.**

A. My name is David Mercado. I am the Vice President of High Voltage and System Operations for the Company.

**Q. PLEASE SUMMARIZE YOUR EDUCATIONAL AND WORK BACKGROUND.**

A. I hold a Bachelor of Science degree in Electrical Engineering from Rice University. I am a licensed professional engineer in the state of Texas, and I am certified with NERC as a System Operator. I began my career with the Company in 2001. My positions within the Company have included Associate Engineer, Engineer, Senior Engineer and Staff Engineer in Transmission Planning, Lead Engineer and Supervising Engineer in Transmission System Protection, Supervising Engineer in Transmission Planning Special Studies, Manager of Real Time Operations Engineering, and Director of Real Time Operations. I was named to my present position in 2022, at which time I assumed responsibility for the Company's high voltage (i.e., transmission and substation operations) and system operations (i.e., real-time transmission and distribution operations).

**Q. WHAT ARE YOUR CURRENT RESPONSIBILITIES AT THE COMPANY?**

A. As Vice President of High Voltage and System Operations, I oversee the construction, installation, operation, and maintenance of the transmission and substation facilities, and I oversee the command-and-control function of the both the Company's transmission and distribution systems.

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

A. I am testifying on behalf of the Company.

**Q. HAVE YOU TESTIFIED PREVIOUSLY?**

A. Yes. I have filed testimony regarding the recovery of May 2024 storm costs in Docket No. 57271 and the Company's base rate proceeding in Docket No. 56211.

**Q. WHAT EXHIBITS HAVE YOU INCLUDED WITH YOUR TESTIMONY?**

A. I have included the one exhibit listed in the Table of Contents as part of my testimony.

**Q. WAS YOUR TESTIMONY PREPARED BY YOU OR BY OTHERS WORKING UNDER YOUR DIRECTION AND CONTROL?**

A. Yes.

## I. OVERVIEW OF TESTIMONY

**Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY AND HOW IS IT ORGANIZED?**

A. There are six operations witnesses – Mr. Deryl Tumlinson, Mr. Randy Pryor, Mr. Eric Easton, Mr. Ronald Bahr, Mr. Christopher Ford, and me – addressing the following subjects.

**Figure DM-2**

**Operations Witnesses and Corresponding Testimony Subjects**

| **Witness** | **Subject of Testimony** |
|---|---|
| Mr. Deryl Tumlinson | Overhead Distribution System |
| **Mr. David Mercado** | **Transmission System and Substations** |
| Mr. Randy Pryor | Strategic Undergrounding and Vegetation Management |

| | |
|---|---|
| Mr. Eric Easton | Damage Prediction, Use of Advanced Analytics, and Wildfire Mitigation |
| Mr. Ronald Bahr | Information Technology |
| Mr. Christopher Ford | Cybersecurity Operations |

My testimony first provides a general overview of the Company's transmission system and substations and the day-to-day activities conducted by the Company to ensure safe and reliable service to the customers and communities that the Company has the privilege to serve. Further, I explain the role of the Transmission and Substation Operations teams for the Company's SRP in responding to Resiliency Events and briefly describe the Resiliency Measures in the Company's SRP related to the transmission system, substations, and control centers.

## II. HIGH VOLTAGE OPERATIONS

**Q. PLEASE DESCRIBE THE HIGH VOLTAGE SYSTEM THAT SERVES THE CUSTOMERS IN THE COMPANY'S SERVICE AREA.**

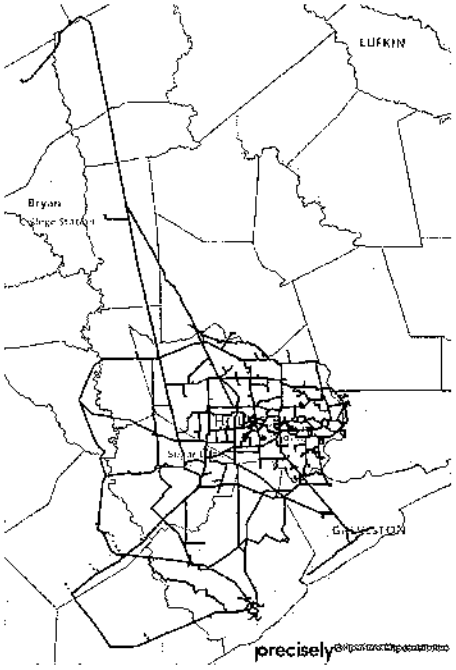
A. The Company's high voltage system is comprised of approximately 3,900 circuit miles of overhead and approximately 26 circuit miles of underground transmission lines. These transmission lines deliver electricity at 69 kV, 138 kV, and 345 kV to 265 Company-owned switchyards/substations, which support the overall ERCOT network transmission system and substations to step down (i.e., reduce) voltage to serve distribution level customers. Additionally, there are 205 substations owned by third parties that are connected to the Company's transmission system.

The Company's transmission system is located in the far southeast corner

of ERCOT, bounded to the east by Entergy Texas, Inc., which is not part of the ERCOT system, and to the south by the Gulf of Mexico. The major transmission connections of the Company's transmission system to the rest of the ERCOT transmission system are six 345 kV circuits connected to the ERCOT "North" zone, which is north and northwest of the Company's service area, and five 345 kV circuits connected to the ERCOT "South" zone, which is southwest of the Company's service area.

With certain exceptions, the Company's transmission system is compact due to the geographic nature of the Company's service area and the large concentration of load within a small geographic area. The Company's transmission system also includes several long transmission lines that bring import power into the Greater Houston area from other areas of ERCOT. A map of the Company's transmission system is shown below.

**Figure DM-3**
**Company Transmission System Map**




The Company utilizes SCADA and a communications network as part of its transmission and substation operations. Additionally, the Company has the information technology infrastructure to provide back-office support functions necessary for transmission service to customers.

Q. **PLEASE DESCRIBE THE COMPANY'S PERSONNEL THAT WORK ON THE HIGH VOLTAGE SYSTEM.**

A. The Transmission Operations team is comprised of approximately 100 employees that are responsible for fieldwork (e.g., maintenance, installation, and construction) on the Company's transmission system. The Substation Operations team is comprised of approximately 250 employees that are responsible for fieldwork on the Company's substations.

**Q. DOES THE COMPANY USE EXTERNAL CONTRACTORS TO ASSIST ITS WORKFORCE?**

A. Yes. The Transmission and Substation Operations teams collectively manage approximately 370 external contractors that provide field work and power restoration services to the Company.

**Q. WHAT KIND OF WORKFORCE DOES THE COMPANY USE WHEN RESPONDING TO A RESILIENCY EVENT?**

**A.** The Company has a combination of internal resources, native contract resources, and mutual assistance resources that the Company calls upon to respond as needed to a Resiliency Event.

**Q. WILL THE TRANSMISSION AND SUBSTATION OPERATIONS TEAMS AND EXTERNAL CONTRACTORS BE INVOLVED IN IMPLEMENTATING THE RESILIENCY MEASURES IN THE 2026-2028 T&D SRP RELATED TO THE TRANSMISSION SYSTEM AND SUBSTATIONS?**

A. Yes. As the teams that are responsible for the field and real-time operations of the Company's transmission system and substations, the Company's Transmission and Substation Operations teams, with assistance from and oversight over external contractors, will play a pivotal role in planning and coordinating the safe implementation of the Resiliency Measures defined in the SRP.

**Q. DOES THE COMPANY HAVE EXPERIENCE IN MAKING ITS HIGH VOLTAGE SYSTEM MORE RESILIENT?**

A. Yes. The Company has extensive experience in making the high voltage system more resilient. Later in my testimony, I describe the past and current activities conducted by the Company to make its high voltage system more resistant to

damage caused by Resiliency Events. For example, from 2020 to 2023, the Company invested approximately $991 million to make its transmission system and substations more resilient. Figure DM-4 below summarizes the resiliency-related investments made by the Company for its transmission system and substations from 2020 to 2023.

**Figure DM-4**

**2020-2023 Investments in Transmission System and Substations (in millions)**

| Description | 2020 | 2021 | 2022 | 2023 | Total |
|---|---|---|---|---|---|
| Transmission System Hardening | 12 | 159 | 274 | 166 | $ 611 |
| Substation Flood Control | 18 | 13 | 20 | 20 | $ 71 |
| Substation Physical Security | 5 | 20 | 24 | 10 | $ 59 |
| S90 Tower Replacements | 3 | 20 | 55 | 14 | $ 92 |
| 69/138 kV Conversions | 16 | 3 | 49 | 90 | $ 158 |
| **Total 2020 - 2023** | **$ 54** | **$ 215** | **$ 422** | **$ 300** | **$ 991** |

## III. TRANSMISSION OPERATIONS AND RESILIENCY

**Q. PLEASE DESCRIBE THE DAY-TO-DAY ACTIVITIES CONDUCTED BY THE COMPANY TO MAINTAIN AND OPERATE ITS TRANSMISSION SYSTEM.**

A. The Company's day-to-day transmission operations and maintenance can be generally categorized into the following six (6) activities:

- Inspection and maintenance of transmission equipment and facilities that serve existing customers;
- Repair or replacement of transmission equipment and facilities that have been damaged or are non-functioning;
- Upgrades to transmission equipment and facilities;
- Construction, installation, or reconfiguration of transmission equipment and

facilities to serve both new and existing customers;

- Vegetation management (proactive tree trimming, reactive tree trimming, hazard tree identification and removal, right-of-way mowing, emergency and post-storm activities); and
- Restoration of service after an outage event, such as an extreme weather event or major storm.

**Q. DO THESE ACTIVITIES SUPPORT THE RESILIENCY OF THE COMPANY'S TRANSMISSION SYSTEM?**

A. Yes. These day-to-day activities support the overall resiliency of the transmission system to provide service to the Company's customers. The Company's transmission system is exposed to the elements, wildlife (e.g., bird strikes), and vegetation. Thus, it is susceptible to wear and tear and other damage that require continuous monitoring, inspection, and maintenance. Additionally, the Company's transmission circuits are more susceptible to common wind events and lightning damage given their height and size. The Company's routine maintenance activities are key to supporting the resiliency of the transmission system and identifying and resolving issues before a failure that could impact service to our customers. Examples of each day-to-day activity are described below.

**Q. DOES THE COMPANY CONDUCT REGULAR INSPECTIONS OF ITS TRANSMISSION SYSTEM?**

A. Yes. The Company's transmission system is maintained on a 5-year inspection and maintenance cycle. The Company has a comprehensive transmission line inspection and rehabilitation program that is coordinated with the transmission

vegetation management program to ensure that the integrity of existing transmission lines and their associated individual components (e.g. structures, conductors, insulators, hardware, etc.) and rights-of-way are maintained. The inspection may also identify additional needs for vegetation management, encroachment mitigation, and/or access improvement. Approximately twenty percent of the transmission system, which amounts to approximately 835 circuit miles of transmission, is ground inspected and maintained each year. Under the inspection program, the Company performs an additional annual aerial patrol to identify any imminent transmission line maintenance issues. The Company identifies any transmission equipment, facilities, or vegetation conditions likely to cause a failure or circuit outage and takes appropriate corrective action in accordance with NESC requirements. The Company also performs planned ground line treatment of wood poles with specialized chemicals as a preventive measure to extend wood pole life. This is scheduled on a coordinated 10-year cycle with the circuit inspections. To aid in the execution of this program, the Company uses approximately 370 personnel and external contractors that are primarily in the field daily. These individuals are trained to observe the condition of transmission facilities and equipment and report any unusual conditions, including vegetation-related issues, that may require corrective action by the Company.

**Q. HOW DOES THE COMPANY IDENTIFY WHETHER TRANSMISSION STRUCTURES OR EQUIPMENT NEED TO BE REPAIRED OR REPLACED?**

A. As described above, the Company identifies necessary repairs and replacements

through the transmission line inspection and rehabilitation program. Additionally, the Company determines whether a repair or replacement needs to be made when there are transmission circuit outages. Line patrols in the field evaluate circuit outages for an initial cause, and a diverse outage review team of engineering and operating personnel conduct a supplemental review to determine the root cause of every outage. Lightning data from the National Lightning Detection Network is also analyzed to determine if an outage coincides with a lightning stroke in the area and whether grounding or line insulation design specifications were exceeded. These activities all help the Company identify whether transmission infrastructure needs to be repaired or replaced.

Q. **WHAT IS CHARACTERIZED AS AN UPGRADE TO EXISTING TRANSMISSION EQUIPMENT AND FACILITIES?**

A. In general, a transmission upgrade is characterized as a project that increases the resiliency of the transmission system. The Company has ongoing efforts to harden its transmission infrastructure. Examples include targeted expenditures for rebuilding transmission lines to meet the most recent NESC extreme wind and ice loading requirements, incorporating engineered transmission construction materials, rebuilding transmission line river crossings with monopole structures within floodways to improve resilience during flood conditions, and retrofitting transmission lines with anti-galloping devices to avoid damage from icing conditions.

Q. **DOES THE COMPANY HAVE EXPERIENCE IN CONSTRUCTING, INSTALLING, AND RECONFIGURING TRANSMISSION EQUIPMENT AND FACILITIES TO SERVE BOTH NEW AND EXISTING CUSTOMERS?**

A. Yes. The Company has extensive experience in building, installing, and reconfiguring new high voltage infrastructure. The Company has the privilege of serving the growing customer base in the Greater Houston area, which is rapidly expanding. The Company proudly serves and interconnects new residential, commercial, generation, and industrial customers while remaining cognizant of the existing and future needs of the existing customer base. This growing customer load drives the planning, forecasting, and identification of projects. To adequately serve both new and existing customers, the Company must take necessary actions that include installing new transmission lines, reconfiguring existing transmission circuits to interconnect new generation capacity and industrial customers, and upgrading circuit ratings to allow for additional capacity on existing transmission lines.

Q. **DOES THE COMPANY HAVE A TRANSMISSION VEGETATION MANAGEMENT PROGRAM?**

A. Yes. The transmission vegetation management program is performed approximately three months ahead of each circuit inspection, in accordance with the Company's transmission line clearance guidelines. This timeframe allows for the Company to verify proper line clearances during circuit inspections and use common access for inspection and construction activities. Herbicides are also

applied to slow woody growth of fast-growing species located in the rights-of-way. The Company performs an annual helicopter patrol to identify any dead trees outside of the transmission rights-of-way that are in danger of falling into transmission lines during high winds events and should be removed. The Company's vegetation management practices are further discussed by Mr. Randy Pryor.

**Q. HOW DOES THE TRANSMISSION AND SUBSTATION OPERATIONS TEAMS RESPOND TO A DAY-TO-DAY STORM?**

A. For day-to-day weather events, the Transmission and Substation Operations teams have a duty manager/supervisor and an associated duty crew that work in coordination with transmission control personnel to safely restore the system to normal operation.

**Q. IS IT IMPORTANT FOR THE COMPANY TO HAVE A RESILIENT TRANSMISSION SYSTEM?**

A. Yes. The Company's transmission system is the backbone of the Company's electric infrastructure and is critical to serving the Company's customers. Given the current challenges of building new thermal generation capacity near the Greater Houston area, customers are highly dependent on the Company's transmission system to import the necessary electricity from other areas in ERCOT outside the Company's service area. Outages on the Company's transmission system, especially to the transmission import paths, will have a significant impact on the Company's ability to transmit and distribute electricity to serve its customers. Thus, it is vital that the Company have and maintain a resilient transmission system.

**Q. DOES THE COMPANY HAVE EXPERIENCE IN MAKING ITS TRANSMISSION SYSTEM MORE RESILIENT?**

A. Yes. The Company has primarily relied on hardening activities to enhance the resiliency of its transmission system. For example, the Company has extensive experience in replacing wooden transmission structures with sturdier steel or concrete structures. Similarly, the Company has extensive experience replacing 90-degree tower structures with structures that meet the current NESC extreme wind loading standards. Figure DM-5 below summarizes the investments made by the Company on a broader range of transmission system resiliency from 2020-2023.

**Figure DM-5**

**2020-2023 Investments in Transmission System Resiliency (in millions)**

| Description | 2020 | 2021 | 2022 | 2023 | Total |
|---|---|---|---|---|---|
| Transmission System Hardening | 12 | 159 | 274 | 166 | $ 611 |
| S90 Tower Replacements | 3 | 20 | 55 | 14 | $ 92 |
| 69/138 kV Conversions | 16 | 3 | 49 | 90 | $ 158 |
| **Total 2020 - 2023** | **$ 31** | **$ 182** | **$ 378** | **$ 270** | **$ 861** |

**Q. HAVE THE COMPANY'S HARDENING ACTIVITIES PROVIDED A BENEFIT TO ITS CUSTOMERS?**

A. Yes. Since 2007, the Company has systematically reduced transmission wooden structure exposure by approximately 75%, by using engineered materials, such as concrete and steel, to build and upgrade transmission lines. The Company's hardening activities have physically strengthened transmission structures against extreme wind events. For example, the Company hardened approximately 16 circuit miles of the 138 kV circuit from Angleton to West Columbia. Specifically, the Company has reconducted the circuits with the latest conductor and replaced

wooden structures with concrete and/or steel structures that meet the current NESC extreme wind loading standards. Notably, the Angleton to West Columbia circuit did not sustain physical damage during Hurricane Beryl.

## IV. SUBSTATION OPERATIONS AND RESILIENCY

**Q. PLEASE DESCRIBE THE DAY-TO-DAY ACTIVITIES CONDUCTED BY THE COMPANY TO MAINTAIN AND OPERATE ITS SUBSTATIONS.**

A. The Company performs periodic and routine inspections on substation equipment to verify pressures and levels for SF6, oil, nitrogen levels, transformer and breaker cabinet heaters, alarms, and supporting circuitry. Inspections are conducted monthly for 345 kV substations and select 138 kV substations. Inspections for the remaining substations are scheduled every two (2) months. The Company performs inspections and protection system maintenance according to manufacturer recommendations or in accordance with NERC maintenance interval requirements, whichever is more frequent. In addition, the Company conducts bi-annual training in advance of the ERCOT summer and winter inspection periods as well as annual EOP training.

**Q. IS IT IMPORTANT FOR THE COMPANY TO HAVE RESILIENT SUBSTATIONS?**

A. Yes. The Company's substations are responsible for stepping down (i.e., reducing) transmission voltage to a level that can be distributed to, and ultimately consumed by, our customers. Overhead distribution facilities, the URD system, and the MUG network are all connected to, and receive stepped-down electricity from, substations. A substation that has an outage impacts all the distribution circuits

connected to the substation, and, consequently, the customers served by those distribution circuits. It is vital for the Company to have and maintain resilient substations to serve its customers.

**Q. IS YOUR ORGANIZATION RESPONSIBLE FOR THE CONSTRUCTION OF NEW SUBSTATIONS AND THE EXPANSION OF EXISTING SUBSTATIONS?**

A. Yes. Once the Company has determined that a new substation is needed or that an existing substation needs to be expanded, the Substation Operations team is responsible for overseeing construction or expansion.

**Q. WHAT CIRCUMSTANCES NECESSITATE THE CONSTRUCTION OF A NEW SUBSTATION OR THE EXPANSION OF AN EXISTING SUBSTATION?**

A. As it relates to substations that serve distribution customers, the Company will either construct a new substation or expand an existing substation based on load growth from existing customers, load growth from new customers, capacity issues, and general reliability issues.[1]

**Q. DO NEW SUBSTATIONS PROVIDE A BENEFIT TO CUSTOMERS?**

A. Yes. New substations allow the Company to increase its system capacity and serve future and existing customer loads. Additionally, new substations allow the Company to reconfigure its distribution system to decrease the number of distribution circuits that could be affected by a Resiliency Event.

[1] The Company also constructs new substations or expands existing substations to facilitate the interconnection of generation or for new transmission lines or the re-configuration of existing transmission lines.

As an example, assume that Substation A provides service to 10 existing distribution circuits. The Company constructs new Substation B and reconfigures its distribution system such that Substation A now provides service to only 5 of the 10 existing distribution circuits. New Substation B provides service to the 5 remaining distribution circuits. A major storm damages Substation A, causing it to be out of service. Because of new Substation B, only 5 distribution circuits experienced an outage. If new Substation B were not constructed, then customers on all 10 existing distribution circuits would experience an outage.

**Q. WHAT IS A MOBILE SUBSTATION?**

A. In the context of a distribution substation, a transformer is equipment that steps down (i.e., reduces) voltage. A mobile substation is a portable transformer that has "plug and play" capability. When a transformer is damaged or otherwise out of service at a substation, a mobile substation can be connected to distribution circuits and provide voltage step down service.

**Q. DOES THE COMPANY HAVE EXPERIENCE IN OPERATING MOBILE SUBSTATIONS?**

A. Yes. During Hurricane Harvey in 2017, several of the Company's substations were inundated with water, causing some transformers to be out of service. The Company used mobile substations to provide voltage step down service to affected distribution circuits. Additionally, the Company deploys mobile transformers for reasons other than weather-related events, like to support execution of capital projects, mitigate material delays, and aid restoration efforts related to failed equipment.

**Q. DO MOBILE SUBSTATIONS PROVIDE A BENEFIT TO CUSTOMERS?**

A. Yes. Mobile substations allow the Company to provide service, on a stop-gap basis, to distribution circuits affected by a transformer outage until a permanent solution is developed. This applies to both day-to-day outages as well as outages related to resiliency events.

**Q. DOES THE COMPANY HAVE EXPERIENCE IN MAKING ITS SUBSTATIONS MORE RESILIENT?**

A. Yes. The Company has made resiliency-related investments to its substations in a few ways. First, Company has mitigated risk associated with flooding and high-water events by elevating substations, control cubicles, and related equipment (e.g., protective relays, switchgears, and remote terminal units). Second, the Company has also invested in substation security to prevent physical attacks and intrusions by upgrading its substation security monitoring, notification equipment, and physical fencing. Figure DM-6 below summarizes the amount spent by the Company on substation resiliency from 2020-2023.

**Figure DM-6**

**2020-2023 Investments in Substation Resiliency**
**(in millions)**

| Description | 2020 | 2021 | 2022 | 2023 | Total |
|---|---|---|---|---|---|
| Substation Flood Control | 18 | 13 | 20 | 20 | $ 71 |
| Substation Physical Security | 5 | 20 | 24 | 10 | $ 59 |
| **Total 2020 - 2023** | **$ 23** | **$ 33** | **$ 44** | **$ 30** | **$ 130** |

**Q. HAVE THE COMPANY'S RESILIENCY-RELATED INVESTMENTS ON SUBSTATIONS PROVIDED A BENEFIT TO CUSTOMERS?**

A. Yes. Given the Greater Houston area's proximity to the Gulf Coast, flooding and high-water events are a major risk to the Company's transmission and distribution

system. For example, Hurricane Harvey caused severe flooding through the Greater Houston area, causing 17 of the Company's substations to be inundated with water, of which 8 substations were taken out of service as a precautionary measure. Elevating substations, control cubicles, and related equipment mitigate the risk that flooding and high-water events may impact the operation of the Company's substations. Similarly, enhancing physical security at substations deters and detects bad actors. The spate of substation attacks that recently occurred in North Carolina, Washington, and Oregon, and the resulting power outages, illustrate the need to ensure the physical security of substations.

**Figure DM-7**
**Flooding to a Company Substation**


## V. RESPONSE TO RESILIENCY EVENTS

**Q. HOW DO THE TRANSMISSION AND SUBSTATION OPERATIONS TEAMS PREPARE FOR A RESILIENCY EVENT?**

A. The Transmission and Substation Operations teams maintain a duty manager/supervisor and an associated duty crew list to respond to ongoing situations on a 24-hour basis. In addition, the Transmission and Substation Operations teams review the Company's EOP and conduct drills prior to each

hurricane season so that all team members are informed of their roles and responsibilities during a Resiliency Event.

**Q. WHAT IS THE ROLE OF THE TRANSMISSION AND SUBSTATION OPERATIONS TEAMS IN RESPONDING TO A RESILIENCY EVENT?**

A. During a Resiliency Event, the Transmission and Substation Operations centers, working in coordination with transmission control personnel, plan and direct transmission and substation restoration from the Company's High Voltage Department Operations Center ("HVDOC"). HVDOC is the cross-functional strategic team that provides guidance regarding high voltage restoration priorities to the RTO, Substation Department Operations Center, and Transmission Department Operations Center. HVDOC also compiles and communicates status updates regarding the current restoration strategy to the designated Emergency Operations Center operations leader.

## VI. WORK ORDERS

**Q. HOW DOES THE COMPANY CREATE AND IMPLEMENT WORK ORDERS?**

A. As discussed by Mr. Nathan Brownell in more detail, the Company has well-established processes and systems for the day-to-day, cross-departmental planning and scheduling of work orders for projects and programs. Work order implementation is updated continuously based on a combination of schedules, SAP work order statuses, daily status updates. This ensures that the Company has sufficient personnel and material to implement work orders for construction, installation, and replacement projects. The Company can and will augment and

increase personnel, typically by staffing additional external contractors, depending on the nature of work that is involved. Following an event in which a portion of the transmission system has sustained damage, the Company procures additional external contractors necessary to conduct power restoration and repair damages through a combination of requests to our current native contract resources and mutual assistance resources.

## VII. TRANSMISSION SYSTEM, SUBSTATION, AND CONTROL CENTER RESILIENCY MEASURES

**Q. PLEASE DESCRIBE THE RESILIENCY MEASURES RELATED TO THE COMPANY'S HIGH VOLTAGE SYSTEM THAT YOU ARE PROVIDING TESTIMONY ON.**

A. There are thirteen (13) Resiliency Measures in the Company's SRP that are related to either the transmission system, substations, or control centers. There are five (5) transmission system-related Resiliency Measures that will harden the transmission system to mitigate the impact of extreme wind events, like hurricanes, tropical storms, and major storms; seven (7) substation-related Resiliency Measures that will mitigate the impact of extreme water events, like flooding and high water events, as well detect, deter and mitigate the impact of substation fires, enhance physical security, or modernize substation communication equipment; and one (1) control-center Resiliency Measure that will mitigate the impact of an extreme water event, like flooding or high waters. The table below summarizes these thirteen Resiliency Measures.

**Figure DM-8**

**Transmission System, Substation, and Control Center-Related Resiliency Measures Estimated Costs and CMI (in millions)**

| Resiliency Measure | Resiliency Event to be Mitigated | SRP Rule Category | Estimated Capital Costs 2026-2028 | Estimated O&M Costs 2026-2028 | Estimated Total Costs 2026-2028 | Estimated CMI Savings |
|---|---|---|---|---|---|---|
| Transmission System Hardening (RM-6) | Hurricane Tropical storm Major storm Wind event | Hardening | $1,467.3 | $0.8 | $1,468.0 | 223.8 |
| 69 kV Conversions (RM-7) | Hurricane Tropical storm Major storm Wind event | Hardening | $369.3 | None | $369.3 | 65.5 |
| S90 Tower Replacements (RM-8) | Hurricane Tropical storm Major storm Wind event | Hardening | $118.4 | None | $118.4 | 59.5 |
| Coastal Resiliency Projects (RM-9) | Hurricane Tropical storm Major storm Wind event | Hardening | $177.4 | $0.8 | $178.1 | 7.8 |
| Substation Flood Control (RM-10) | Flooding High water event | Flood Mitigation | $43.8 | None | $43.8 | 3.9 |
| Control Center Flood Control (RM-11) | Flooding High water event | Flood Mitigation | $7.0 | None | $7.0 | 2.5 |
| Mobile Substations (RM-13) | Hurricane Tropical storm Major storm Wind event | Modernization | $30.0 | None | $30.0 | 3.9 |
| Anti-Galloping Technologies (RM-14) | Hurricane Tropical storm Major storm Wind event | Hardening | $14.0 | $1.0 | $15.0 | 5.3 |
| Distribution Capacity Enhancement/ Substation (RM-16) | Extreme freeze | Modernization | $579.6 | None | $579.6 | 138.1 |
| Substation Fire | Substation | Hardening | $9.0 | None | $9.0 | 1.5 |

| Resiliency Measure | Resiliency Event to be Mitigated | SRP Rule Category | Estimated Capital Costs 2026-2028 | Estimated O&M Costs 2026-2028 | Estimated Total Costs 2026-2028 | Estimated CMI Savings |
|---|---|---|---|---|---|---|
| Barriers (RM-20) | fire | | | | | |
| Digital Substation (RM-21) | General Resiliency Events | Modernization | $31.8 | None | $29.4 | 1.2 |
| Substation Physical Security Fencing (RM-26) | Physical intrusion or attack | Physical Security | $18.0 | None | $18.0 | 17.6 |
| Substation Security Upgrades (RM-27) | Physical intrusion or attack | Physical Security | $19.4 | $0.1 | $19.5 | 25.1 |
| **Total** | | | **$2,884.9** | **$2.6** | **$2,887.5** | **555.7** |

**Q. WILL THESE RESILIENCY MEASURES ENHANCE THE RESILIENCY OF THE COMPANY'S TRANSMISSION SYSTEM, SUBSTATIONS, AND CONTROL CENTER?**

A. Yes. Hardening of structures, flood mitigation programs, enhanced physical security, and modernization are widely proven, best practices within the utility industry to enhance system resiliency, mitigate against extreme weather events, and improve the security posture. As previously mentioned in my testimony, the Company's activities to harden the transmission system provides significant benefits to customers by further strengthening transmission circuits against high wind events. Elevating substation equipment provides benefits to customers by allowing substations to operate during flood or high-water conditions and decreasing the probability of component damage that may lead to outages and longer customer restoration timelines. Enhanced physical security at substations provides a benefit to customers by further deterring and detecting bad actors.

Finally, upgrading substation communication equipment from copper-based to fiber-based benefits customers by reducing costs, enhancing communications capabilities, and providing real-time situational awareness.

## VIII. CONCLUSION

**Q. IS IMPLEMENTING THE RESILIENCY MEASURES IN YOUR TESTIMONY IN THE PUBLIC INTEREST?**

A. Yes.

**Q. SHOULD THE COMMISSION APPROVE THE 2026-2028 T&D SRP?**

A. Yes.

**Q. DOES THIS CONCLUDE YOUR DIRECT TESTIMONY?**

A. Yes.

STATE OF Texas §
§
COUNTY OF Harris §

**AFFIDAVIT OF DAVID MERCADO**

BEFORE ME, the undersigned authority, on this day personally appeared DAVID MERCADO who having been placed under oath by me did depose as follows:

1. "My name is DAVID MERCADO. I am of sound mind and capable of making this affidavit. The facts stated herein are true and correct based upon my personal knowledge.

2. I have prepared the foregoing Direct Testimony and the information contained in this document is true and correct to the best of my knowledge."

Further affiant sayeth not.

DAVID MERCADO

SUBSCRIBED AND SWORN TO BEFORE ME on this 8th day of January, 2025.

Notary Public in and for the State of Texas

My commission expires: 3/16/2025

PETRA CUSTER
NOTARY ID #12683270-2
My Commission Expires
March 16, 2025

**Exhibit DM-1: Glossary of Acronyms**

| | |
|---|---|
| 2026-2028 T&D SRP or SRP | The Company's 2026-2028 Transmission and Distribution System Resiliency Plan |
| Company | CenterPoint Energy Houston Electric, LLC |
| Commission | Public Utility Commission of Texas |
| EOP | Emergency Operations Plan |
| ERCOT | Electric Reliability Council of Texas, Inc. |
| HVDOC | High Voltage Department Operations Center |
| kV | Kilovolt |
| MUG | Major Underground |
| NERC | North American Electric Reliability Corporation, Inc. |
| NESC | National Electrical Safety Code |
| O&M | Operations and Maintenance |
| Resiliency Event | An event involving extreme weather conditions, wildfires, cybersecurity threats, or physical security threats that poses a material risk to the safe and reliable operation of the Company's transmission and distribution systems. |
| Resiliency Measure | A measure designed to prevent, withstand, mitigate, or more promptly recover from the risks posed to the Company's transmission and distribution system by a Resiliency Event. |
| RTO | Regional Transmission Organization |
| SCADA | Supervisory Control and Data Acquisition |
| SF6 | Sulfur Hexafluoride |
| URD | Underground Residential Distribution |

This page was intentionally left blank.

# EXHIBIT 5

# THE DIRECT TESTIMONY OF COMPANY WITNESS MR. RANDY PRYOR

This page was intentionally left blank.

**DOCKET NO. 57579**

| | | |
|---|---|---|
| **APPLICATION OF CENTERPOINT ENERGY HOUSTON ELECTRIC, LLC FOR APPROVAL OF ITS 2026-2028 TRANSMISSION AND DISTRIBUTION SYSTEM RESILIENCY PLAN** | **§ § § § §** | **PUBLIC UTILITY COMMISSION OF TEXAS** |

# DIRECT TESTIMONY OF

# RANDY PRYOR

# ON BEHALF OF

# CENTERPOINT ENERGY HOUSTON ELECTRIC, LLC

**JANUARY 2025**

## TABLE OF CONTENTS

## TABLE OF EXHIBITS AND WORKPAPERS

| Exhibit | Description |
|---|---|
| RP-1 | Glossary of Acronyms |

# EXECUTIVE SUMMARY

The Company's 2026-2028 T&D SRP aims to strengthen the Company's transmission and distribution system to maintain reliable service for its customers during Resiliency Events. The SRP contains thirty-nine (39) Resiliency Measures. As the Vice President of Major Underground and Distribution Modernization, I am responsible for six (6) Resiliency Measures that are related to the Company's MUG, URD system, and vegetation management. These six (6) Resiliency Measures are intended to enhance the resiliency of the Company's distribution system by modernizing underground infrastructure, by strategically undergrounding overhead distribution facilities, and by conducting accelerated vegetation management on all distribution circuits. Cumulatively, these six (6) Resiliency Measures will cost approximately $1,294.2 million in capital costs and $146.1 million in incremental O&M expense from 2026-2028.

**Figure RP-1**

**MUG, URD System, and Vegetation Management-Related Resiliency Measures Estimated Costs and CMI (in millions)**

| Resiliency Measure | Resiliency Event to be Mitigated | T&D SRP Rule Category | Estimated Capital Costs 2026-2028 | Estimated O&M Costs 2026-2028 | Estimated Total Costs 2026-2028 | Estimated 3-Year CMI Savings |
|---|---|---|---|---|---|---|
| Strategic Undergrounding (RM-2) | Hurricane Tropical storm Major storm Wind event Physical damage by third parties | Undergrounding | $860.0 | None | $860.0 | 81.1 |
| Vegetation Management (RM-5) | Hurricane Tropical storm Major storm Wind event Physical | Vegetation Management | None | $146.1 | $146.1 | 137.0 |

| Resiliency Measure | Resiliency Event to be Mitigated | T&D SRP Rule Category | Estimated Capital Costs 2026-2028 | Estimated O&M Costs 2026-2028 | Estimated Total Costs 2026-2028 | Estimated 3-Year CMI Savings |
|---|---|---|---|---|---|---|
| | damage by third parties | | | | | |
| MUCAMS (RM-12) | Flooding | Modernization | $10.8 | None | $10.8 | 0.6 |
| MUG Reconductor (RM-17) | Corrosion and degradation | Modernization | $245.0 | None | $245.0 | 13.6 |
| URD Cable Modernization (RM-18) | Corrosion and degradation | Modernization | $128.4 | None | 128.4 | 13.0 |
| Wildfire Strategic Undergrounding (RM-23) | Wildfire | Undergrounding | $50.0 | None | $50.0 | N/A* |
| **Total** | | | **$1,294.2** | **$146.1** | **1,440.3** | **245.3** |
| *Note: Please see Section 5 of Exhibit ELS-2 for a qualitative analysis of this Resiliency Measure. | | | | | | |

The Company will utilize its well-established processes to ensure the Company has sufficient personnel and material to implement the Resiliency Measures, and the Company can and will augment and increase personnel, typically through the staffing of additional external contractors, if needed.

## INTRODUCTION

**Q. PLEASE STATE YOUR NAME AND CURRENT POSITION.**

A. My name is Randal M. Pryor, and I am the Vice President of Major Underground and Distribution Modernization for the Company.

**Q. PLEASE SUMMARIZE YOUR EDUCATIONAL AND WORK BACKGROUND.**

A. I graduated from Texas A&M University in 1990 with a Bachelor of Science degree in Agricultural Economics. I began my career with Houston Lighting & Power, a CNP predecessor company, in June of 1991. Since that time, I have been employed by CNP or one of its affiliates. My positions within the Company and predecessor companies have included Financial Analyst, Supervisor/Manager/Director of Financial Planning, Service Area Director, Operations Director, Vice President of Regional Operations for CNP's Texas gas utility, Vice President of Distribution Operations, and Vice President of Distribution Projects and Grid Modernization. In November 2022, I assumed my present position, which oversees the Company's major underground operations, distribution metering, and distribution system modernization projects.

**Q. WHAT ARE YOUR CURRENT RESPONSIBILITIES AT CNP?**

A. My current responsibilities include overseeing programs related to:

- distribution overhead and underground residential construction;
- overhead distribution and underground residential design, reliability, and resiliency;
- overhead distribution and underground residential system inspection programs;
- street lighting;
- vegetation management;
- installation of distribution metering facilities; and

- construction, maintenance, and operation of the Company's three-phase underground system.

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

A. I am testifying on behalf of the Company.

**Q. HAVE YOU TESTIFIED PREVIOUSLY?**

A. Yes. I have filed testimony with the Commission in Docket Nos. 49421 and 56211 and the Railroad Commission of Texas in Gas Utilities Docket Nos. 10432, 10567, and 10669.

**Q. WHAT EXHIBITS HAVE YOU INCLUDED WITH YOUR TESTIMONY?**

A. I have included the one exhibit listed in the Table of Contents as part of my testimony.

**Q. WAS YOUR TESTIMONY PREPARED BY YOU OR BY OTHERS WORKING UNDER YOUR DIRECTION AND CONTROL?**

A. Yes.

## OVERVIEW OF TESTIMONY

**Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY AND HOW IS IT ORGANIZED?**

A. There are six operations witnesses – Mr. Deryl Tumlinson, Mr. David Mercado, Mr. Eric Easton, Mr. Ronald Bahr, Mr. Christopher Ford, and me – addressing the following subjects.

| **Witness** | **Subject of Testimony** |
|---|---|
| Mr. Deryl Tumlinson | Overhead Distribution System |
| Mr. David Mercado | Transmission System and Substations |
| **Mr. Randy Pryor** | **Strategic Undergrounding and Vegetation Management** |

| Witness | Subject of Testimony |
|---|---|
| Mr. Eric Easton | Damage Prediction, Use of Advanced Analytics, and Wildfire Mitigation |
| Mr. Ronald Bahr | Information Technology |
| Mr. Christopher Ford | Cybersecurity Operations |

My testimony provides a general overview of the Company's URD system, MUG network, and the Company's strategic undergrounding and vegetation management programs. With this context in mind, my testimony briefly describes the Resiliency Measures in the Company's SRP that are related to URD, undergrounding, and vegetation management.

## THE COMPANY'S URD SYSTEM

**Q. PLEASE DESCRIBE THE COMPANY'S TRANSMISSION AND DISTRIBUTION SYSTEM THAT SERVES THE CUSTOMERS IN THE COMPANY'S SERVICE AREA.**

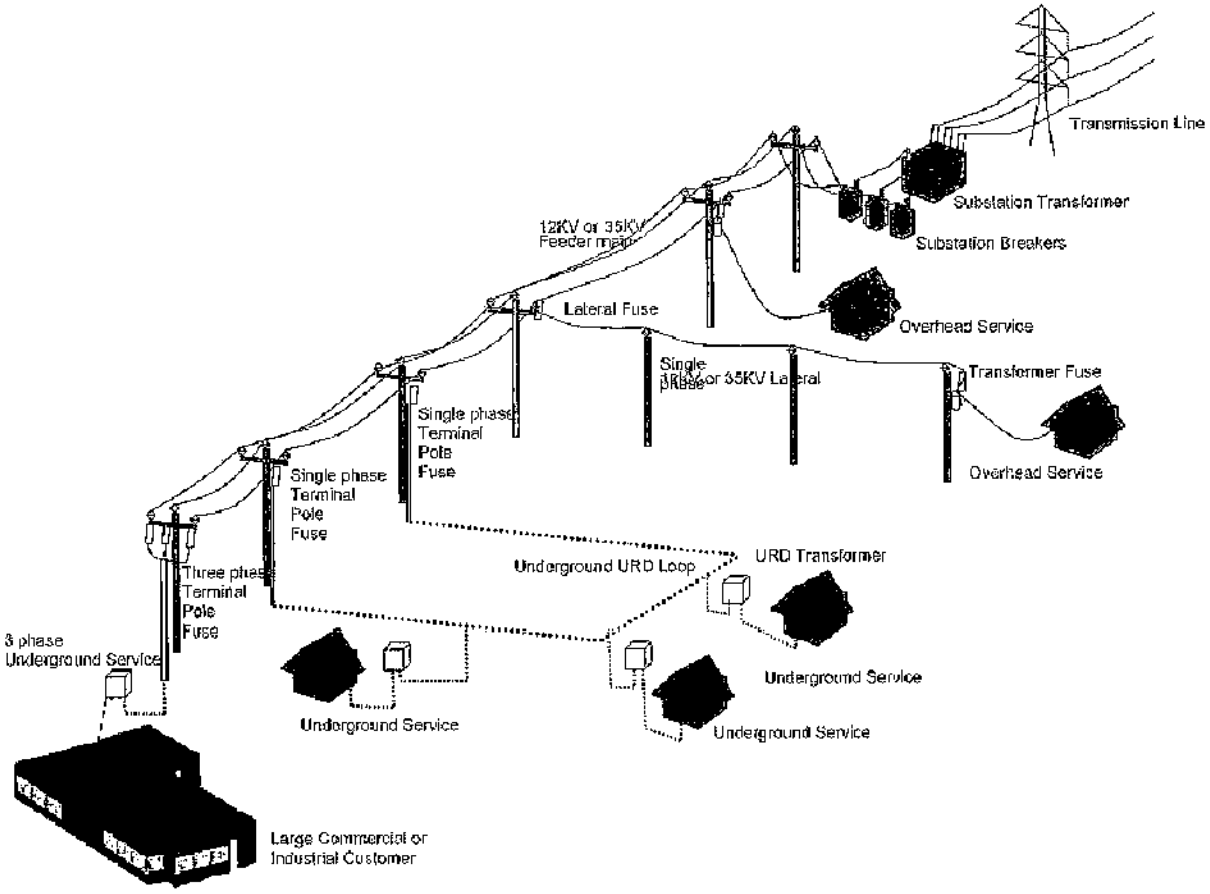
A. At a general level, the Company's transmission and distribution system is comprised of approximately 3,900 miles of overhead transmission lines that deliver electricity at 69 kV, 138 kV, and 345 kV; over 260 substations that step down (i.e., reduce) voltage to serve distribution customers; approximately 30,000 miles of overhead distribution lines and 28,000 miles of underground distribution lines and streetlights; miscellaneous associated equipment (e.g. step-down transformers, insulators, capacitors, fuses); and a telecommunications network. Additionally, CNP and the Company have general information technology infrastructure that provides the back-office support functions needed to provide transmission and distribution service to our customers.

**Q. PLEASE DESCRIBE THE COMPANY'S URD SYSTEM.**

A. The Company's URD system is comprised of more than 24,000 URD loops comprising more than 16,000 miles of cable and associated distribution equipment. The Company's URD system serves approximately 56% of the Company's customers. The Company's URD system is connected to overhead distribution facilities. Figure RP-2 below generally illustrates the Company's URD system, from the substation to overhead distribution facilities to the URD system.

**Figure RP-2**

**URD System**



**Q. CAN THE COMPANY'S URD SYSTEM BE IMPACTED BY RESILIENCY EVENTS SUCH AS HIGH WIND OR A MAJOR STORM?**

A. Yes. The Company's URD system is connected to overhead distribution facilities, so the customers served by URD lines will be impacted to the extent that an overhead distribution facility that is connected to the URD system is damaged. For example, during the May 2024 Derecho event, some customers served by the Company's URD system had outages because of damage sustained by overhead distribution facilities connected to the URD system serving them.

**Q. DOES UNDERGROUNDING SELECT PORTIONS OF THE DISTRIBUTION SYSTEM ENHANCE SYSTEM RESILIENCY?**

A. Yes. Undergrounding distribution facilities enhances system resiliency because their undergrounding mitigates the possibility of physical damage caused by extreme weather events, vegetation, debris, or third parties. As previously stated, however, customers served by underground facilities may still be impacted to the extent that a connected overhead distribution facility sustains damage.

**Q. DOES THE COMPANY'S URD SYSTEM SIMILARLY ENHANCE SYSTEM RESILIENCY BECAUSE THE URD SYSTEM IS UNDERGROUND?**

A. Yes. In addition to mitigating the possibility of physical damage, the Company's URD system also provides the voltage stability needed to safely restore customers during widespread power outages. For example, during Winter Storm Uri in 2021, the Company's URD system provided the voltage stability needed to safely restore a large number of customers more quickly.

**Q. HOW DOES THE COMPANY MAINTAIN ITS URD SYSTEM?**

A. Prior to 2013, the Company's approach to maintaining its URD system was to only replace aged or damaged URD loops. Aged URD loops, meaning URD loops that are over 35 years old, have the highest probability of failure in the Company's URD system. The Company would replace approximately 25-30 aged or damaged URD loops annually.

Beginning in 2013, the Company implemented its Cable Life Extension Program. The Cable Life Extension Program, referred to as the URD Cable Modernization Program, is designed to extend the life of URD loops. The Company utilizes a proactive and technology-based approach to identify potential failures in aged underground cable and other URD components that do not meet design specifications before the failures occur and impact service to customers. Under the URD Cable Modernization Program, the Company utilizes third-party technology to assess and then take any necessary corrective actions to extend the life of URD loops. Once URD loops have been assessed and the necessary corrective actions have been completed, all URD spans within the entire loop are guaranteed to perform to the original manufacturer standards.[1] One of the corrective actions when applicable, is injecting the cable to mitigate future faults. This action is less expensive and more efficient to repair the span of cable versus the time and costs to replace the cable, The Company's URD Cable Modernization Program has extended the useful life of URD loops by mitigating the risk of failure and has reduced the backlog of aging cable and related systems. Annually, the URD Cable Modernization Program extends the useful life of approximately 250-300 URD loops.

[1] The Company's Cable Life Extension Program vendor provides a 15-year guarantee on all assessed URD loops.

**Q. DOES THE COMPANY'S URD CABLE MODERNIZATION PROGRAM PROVIDE A BENEFIT TO CUSTOMERS?**

A. Yes. The URD Cable Modernization Program benefits customers by minimizing unplanned outages that may be caused by a cable failure and by extending the life of URD loops by repairing or replacing underground cables and associated equipment that are at risk of imminent failure. By extending the useful life of the URD loops, the URD Cable Modernization Program has also reduced customer costs associated with the URD system, while at the same time improving reliability. Proactive outage planning typically requires significantly less time and creates less inconvenience for customers compared to an unplanned event.

## STRATEGIC UNDERGROUNDING

**Q. OTHER THAN THE COMPANY'S URD SYSTEM, ARE THERE OTHER DISTRIBUTION FACILITIES THAT ARE UNDERGROUND?**

A. Yes. The Company has a Strategic Undergrounding Program in which overhead distribution facilities located near freeway crossings and interstates are replaced with underground facilities.[2] Overhead distribution facilities located near freeway crossings and the interstate highway system must be taller, relative to traditional overhead distribution facilities, to comply with state and federal vertical clearance requirements. These taller overhead distribution facilities are more susceptible to wind issues and lightning damage, as well as physical damage that results from contact. The Strategic Undergrounding Program replaces overhead distribution facilities with underground

[2] Beginning in 2022, new distribution facilities that are near freeway crossings or interstates were constructed underground, if feasible.

distribution facilities. These underground facilities are less susceptible to physical damage caused by extreme weather events, vegetation, debris, or third-party contact. Additionally, as part of the Strategic Undergrounding Program, older cables and fiber conduit that is more susceptible to failure are replaced with cable that is more reliable and resilient to the effects of moisture and water.[3]

**Q. PLEASE DESCRIBE OTHER PURPOSES FOR IMPLEMENTING THE STRATEGIC UNDERGROUNDING PROGRAM.**

A. One additional purpose for implementing the Strategic Undergrounding Program is the conversion of Three Phase circuits that are currently overhead to underground. In the plan, we have proposed $860.0 million and 111 miles of overhead to underground conversion projects. This conversion would assist to minimize service impacts to some critical customers, such as hospitals and trauma centers from extreme weather or wind events.

**Q. DOES THE COMPANY'S STRATEGIC UNDERGROUNDING PROGRAM PROVIDE A BENEFIT TO CUSTOMERS?**

Yes. Replacing overhead distribution facilities near freeway crossings and interstates with underground crossings along with converting overhead circuits to underground mitigates the possibility of physical damage caused by extreme weather events, vegetation, debris, or third-party contact. Additionally, since large portions of the Company's service area is compact and are urbanized, by undergrounding these distribution facilities it eliminates the risk that these overhead distribution facilities might fall and block or impede transportation access or traffic flow along freeways and the interstate highway system.

[3] I would also note that the duct space for underground distribution facilities allow for the installation of more primary cables that will be used to serve the continued and robust customer growth that has occurred in the Greater Houston area. Please refer to the Direct Testimony of Darin Carroll for a discussion on the customer growth experienced by the Company.

## MUCAMS

**Q. PLEASE DESCRIBE MUCAMS.**

A. MUCAMS is the communications and monitoring network that provides real-time visibility, status, and control of the assets in the Company's underground network located in Downtown Houston and will be included in the Medical Center beginning in 2025 as well as UTMB in Galveston during the course of the 3-year period. MUCAMS includes fiber optic cable, microprocessor relays, protection equipment, and communications equipment.

**Q. DOES THE COMPANY'S MUCAMS PROVIDE A BENEFIT TO CUSTOMERS?**

A. Yes. Because MUCAMS enables real-time visibility, status, and control, MUCAMS allows the Company to respond quickly and efficiently should there be customer outages or equipment failure.

## VEGETATION MANAGEMENT

**Q. PLEASE DESCRIBE THE COMPANY'S VEGETATION MANAGEMENT PROGRAM.**

A. The Company has a vegetation management program for both the transmission and distribution systems. The Company's distribution system vegetation management program has four (4) components:

- Scheduled vegetation maintenance (proactive tree trimming): Proactive tree trimming is the largest component of the Company's vegetation management program for the distribution system. Each distribution circuit is prioritized for trimming based on the circuit's trim cycle and reliability (i.e., SAIDI AND SAIFI). A circuit's trim cycle is

dependent on factors such as: last trim date, vegetation-caused outages, potential impact on critical loads served by the circuit, and overall customer count.

- Unscheduled vegetation maintenance (reactive tree trimming): Reactive tree trimming is conducted to address vegetation issues that require immediate attention.
- Tree risk management (proactive hazard tree removal): The Company identifies vegetation outside of the Company's right-of-way that may pose a risk to distribution facilities. With consent from landowners, the Company trims trees located outside of the Company's right-of-way to mitigate the risk of falling trees impacting the Company's distribution system.
- Emergency and post-storm activities: The Company conducts vegetation management if needed to assist in customer power restoration efforts after an extreme weather event or major storm.

In 2023, the Company conducted proactive tree trimming on approximately 4,600 miles of distribution circuits. In 2024, the Company conducted proactive tree trimming on approximately 5,800 miles of distribution circuits, which included vegetation management on over 2,000 miles of high-risk distribution circuits as part of the GHRI. In 2025, the Company anticipates continuing proactive tree trimming and hazard tree removal, including vegetation management on 4,000 miles of high-risk distribution circuits as part of Phase Two of the GHRI.

The Company's proactive vegetation management for its transmission system is conducted on a five-year rolling cycle with approximately 20% of its circuits being trimmed on an annual basis. Additionally, the Company conducts reactive vegetation management on its transmission system on an as-needed basis.

**Q. WILL THE COMPANY INCREASE ITS VEGETATION MANAGEMENT ACTIVITIES AS PART OF ITS 2026-2028 T&D SRP?**

A. Yes. In response to feedback received from stakeholders, the Company will go to a three-year trim cycle for distribution circuits, regardless of voltage. Currently, 12kV distribution circuits are trimmed on an approximately five-year trim cycle, and 35kV and select 12kV distribution circuits are trimmed on an approximately three-year trim cycle.[4] Additionally, the Company will spend approximately $146.1 million from 2026-2028 to conduct accelerated vegetation management on distribution circuits.

**Q. DO THE COMPANY'S VEGETATION MANAGEMENT PROGRAMS PROVIDE A BENEFIT TO CUSTOMERS?**

A. Yes. The Company's vegetation management programs mitigate the risk of trees and other vegetation from inside or outside the ROW from making contact with transmission or distribution facilities and causing customer power outages. This is particularly important as it relates to extreme weather events involving wind and/or water, and after periods of prolonged drought or extreme temperatures (both heat and freezing) because of their impact on the health of trees and vegetation.

## WORK ORDERS AND COMPOSITION OF WORKFORCE

**Q. HOW DOES THE COMPANY CREATE AND IMPLEMENT WORK ORDERS?**

A. The Company has well-established processes that ensure the Company has sufficient personnel and material to implement work orders for construction, installation, and replacement projects, and for vegetation management. Additionally, the Company can and

[4] The Company's proactive vegetation management activities are based on an analytics model that prioritizes distribution circuits based on several factors, including last trim date, vegetation-caused outages, potential impact on critical loads, and overall customer count impacted.

will augment and increase personnel, typically through the staffing of additional external contractors, depending on the nature of work that is involved. For example, the Company augmented and increased personnel to complete the vegetation management on over 2,000 miles of high-risk distribution circuits as part of Phase One of the GHRI.

**Q. PLEASE DESCRIBE THE COMPANY'S PERSONNEL THAT WORK ON THE COMPANY'S URD SYSTEM, UNDERGROUND NETWORK, MUCAMS, AND VEGETATION MANAGEMENT.**

A. The Company's personnel that work on the URD System, underground network, MUCAMS, and vegetation management comprise approximately 200 employees that are responsible for the design, engineering, and field work.

**Q. DOES THE COMPANY USE EXTERNAL CONTRACTORS TO ASSIST ITS PERSONNEL?**

A. Yes. The Company's personnel manage approximately 650 external contractors that provide field work and vegetation management services to the Company.

**Q. WERE COMPANY PERSONNEL AND EXTERNAL CONTRACTORS INVOLVED IN THE EXECUTION OF PHASE ONE AND PHASE TWO OF THE GHRI?**

A. Yes.

**Q. WILL COMPANY PERSONNEL AND EXTERNAL CONTRACTORS BE INVOLVED IN IMPLEMENTATION OF THE DISTRIBUTION SYSTEM-RELATED RESILIENCY MEASURES IN THE 2026-2028 T&D SRP?**

A. Yes.

**Q. PLEASE DESCRIBE THE RESILIENCY MEASURES RELATED TO THE COMPANY'S DISTRIBUTION SYSTEM THAT YOU ARE PROVIDING TESTIMONY ON.**

A. There are fifteen (15) distribution system-related Resiliency Measures in the Company's 2026-2028 T&D SRP. I am testifying on the six (6) Resiliency Measures that are related to undergrounding, underground modernization, and vegetation management. Company witness Deryl Tumlinson provides testimony on the five (5) Resiliency Measures that are related to the overhead portions of the Company's distribution system. I would also note Company witness Brad Tutunjian provides testimony on the proposed Microgrid Pilot Program, which will involve the Company's distribution system.

**Q. PLEASE SUMMARIZE THE RESILIENCY MEASURES RELATED TO VEGETATION MANAGEMENT AND THE UNDERGROUND PORTIONS OF THE COMPANY'S DISTRIBUTION SYSTEM.**

A. The table below summarizes the six (6) Resiliency Measures that are related to the undergrounding, underground modernization, and vegetation management. In sum, these six (6) Resiliency Measures are intended to mitigate the impact of wind events, hurricanes, tropical storms, major storms, extreme temperatures, and wildfires through a combination of hardening, modernization, and wildfire risk mitigation.

**Figure RP-3**

**MUG, URD System, and Vegetation Management-Related Resiliency Measures**
**Estimated Costs and CMI**
**(in millions)**

| Resiliency Measure | Resiliency Event to be Mitigated | T&D SRP Rule Category | Estimated Capital Costs 2026-2028 | Estimated O&M Costs 2026-2028 | Estimated Total Costs 2026-2028 | Estimated 3-Year CMI Savings |
|---|---|---|---|---|---|---|
| Strategic Undergrounding (RM-2) | Hurricane<br>Tropical storm<br>Major storm<br>Wind event<br>Physical damage by third parties | Undergrounding | $860.0 | None | $860.0 | 81.1 |
| Vegetation Management (RM-5) | Hurricane<br>Tropical storm<br>Major storm<br>Wind event<br>Physical damage by third parties | Vegetation Management | None | $146.1 | $146.1 | 137.0 |
| MUCAMS (RM-12) | Flooding | Modernization | $10.8 | None | $10.8 | 0.6 |
| MUG Reconductor (RM-17) | Corrosion and degradation | Modernization | $245.0 | None | $245.0 | 13.6 |
| URD Cable Modernization (RM-18) | Corrosion and degradation | Modernization | $128.4 | None | 128.4 | 13.0 |
| Wildfire Strategic Undergrounding (RM-23) | Wildfire | Undergrounding | $50.0 | None | $50.0 | N/A* |
| **Total** | | | **$1,294.2** | **$146.1** | **1,440.3** | **157.2** |
| Note: Please see Section 5 of Exhibit ELS-2 for a qualitative analysis of this Resiliency Measure. | | | | | | |

**Q. HOW WILL THESE RESILIENCY MEASURES ENHANCE THE RESILIENCY OF THE COMPANY'S DISTRIBUTION SYSTEM?**

A. The Strategic Undergrounding and Wildfire Strategic Undergrounding Resiliency Measures enhance resiliency by mitigating the impact of weather-related events and

wildfire, respectively. Undergrounding distribution facilities near freeway crossings and interstate highways replace taller overhead distribution facilities that are more susceptible to extreme weather events such as high wind and lighting, as well as third-party contact. Strategically undergrounding distribution facilities in areas of elevated wildfire risk mitigates the possibility that these distribution facilities are either damaged by a wildfire or cause a wildfire.

The MUCAMS, MUG Reconductor, and URD Cable Modernization Resiliency Measures ensure that the underground portions of the Company's distribution system are modernized, replace facilities that are reaching their end of use life, address corrosion and degradation issues associated with undergrounding facilities that could result in customer outages.

## CONCLUSION

**Q. WILL THESE RESILIENCY MEASURES YOU ARE TESTIFYING ON HELP THE COMPANY MEET ITS COMMITMENTS MADE AFTER HURRICANE BERYL?**

A. Yes. The 2026-2028 T&D SRP is the next step the Company will take to enhance the resiliency of its transmission and distribution system for its customer's and making it the most resilient coastal grid in the country.

**Q. IS IMPLEMENTING THE RESILIENCY MEASURES YOU ARE TESTIFYING ON IN THE PUBLIC INTEREST?**

A. Yes.

**Q. SHOULD THE COMMISSION APPROVE PHASE THREE OF THE COMPANY'S GHRI AND RELATED 2026-2028 T&D SRP?**

A. Yes.

**Q. DOES THIS CONCLUDE YOUR DIRECT TESTIMONY?**

A. Yes.

**STATE OF** Texas §
§
**COUNTY OF** Harris §

**AFFIDAVIT OF RANDAL PRYOR**

BEFORE ME, the undersigned authority, on this day personally appeared RANDAL PRYOR who having been placed under oath by me did depose as follows:

1. "My name is RANDAL PRYOR. I am of sound mind and capable of making this affidavit. The facts stated herein are true and correct based upon my personal knowledge.

2. I have prepared the foregoing Direct Testimony and the information contained in this document is true and correct to the best of my knowledge."

Further affiant sayeth not.

RANDAL PRYOR

SUBSCRIBED AND SWORN TO BEFORE ME on this 8th day of January, 2025.

Notary Public in and for the State of Texas

My commission expires: 3/16/2025

PETRA CUSTER
NOTARY ID #12683270-2
My Commission Expires
March 16, 2025

**Exhibit RP-1: Glossary of Acronyms**

| | |
|---|---|
| 2026-2028 T&D SRP or SRP | The Company's 2026-2028 Transmission and Distribution System Resiliency Plan |
| Company | CenterPoint Energy Houston Electric, LLC |
| CNP | CenterPoint Energy, Inc. |
| Commission | Public Utility Commission of Texas |
| GHRI | The Company's Greater Houston Resiliency Initiative |
| kV | kilovolt |
| MUCAMS | Major Underground Communications and Monitoring Systems |
| MUG | Major underground |
| O&M | Operations and maintenance |
| Resiliency Event | An event involving extreme weather conditions, wildfires, cybersecurity threats, or physical security threats that poses a material risk to the safe and reliable operation of the Company's transmission and distribution systems |
| Resiliency Measure | A measure designed to prevent, withstand, mitigate, or more promptly recover from the risks posed to the Company's transmission and distribution system by a Resiliency Event |
| ROW | Right of Way |
| SAIDI | System Average Interruption Duration Index |
| SAIFI | System Average Interruption Frequency Index |
| T&D SRP Rule | 16 Tex. Admin. Code § 25.62 |
| URD | Underground residential distribution |
| UTMB | University of Texas Medical Branch |
| VOLL | Value of loss load |

This page was intentionally left blank.

# EXHIBIT 6

# THE DIRECT TESTIMONY OF COMPANY WITNESS MR. ERIC EASTON

This page was intentionally left blank.

**DOCKET NO. 57579**

| | | |
|---|---|---|
| **APPLICATION OF CENTERPOINT ENERGY HOUSTON ELECTRIC, LLC FOR APPROVAL OF ITS 2026-2028 TRANSMISSION AND DISTRIBUTION SYSTEM RESILIENCY PLAN** | § § § § § | **PUBLIC UTILITY COMMISSION OF TEXAS** |

# DIRECT TESTIMONY OF

# ERIC D. EASTON

# ON BEHALF OF

# CENTERPOINT ENERGY HOUSTON ELECTRIC, LLC

**JANUARY 2025**

## TABLE OF CONTENTS

## TABLE OF EXHIBITS AND WORKPAPERS

| Exhibit | Description |
|---|---|
| EE-1 | Glossary of Acronyms |

## TABLE OF FIGURES

# EXECUTIVE SUMMARY

The Company's 2026-2028 T&D SRP aims to enhance the resiliency of the Company's transmission and distribution system to maintain reliable service for its customers during Resiliency Events. The SRP contains thirty-nine (39) Resiliency Measures. As the Vice President of Electric Grid Transformation and Investment Strategy, I am responsible for six (6) Resiliency Measures related to the risk analysis, planning, and designing of the Company's transmission and distribution system.

## Figure EE-1

**Risk Analysis, Planning, and T&D Design-Related Resiliency Measures**
**Estimated Costs and CMI (in millions)**

| Resiliency Measure | Resiliency Event to be Mitigated | T&D SRP Rule Category | Estimated Capital Costs 2026-2028 | Estimated O&M Costs 2026-2028 | Estimated Total Costs 2026-2028 | Estimated 3-Year CMI Savings |
|---|---|---|---|---|---|---|
| Wildfire Advanced Analytics (RM-22) | Wildfire | Wildfire | None | $0.9 | $0.9 | N/A* |
| Wildfire Vegetation Management (RM-24) | Wildfire | Wildfire | None | $30.0 | $30.0 | N/A* |
| Wildfire IGSD (RM-25) | Wildfire | Wildfire | $19.4 | $0.3 | $19.7 | N/A* |
| Advanced Aerial Imagery/ Digital Twin (RM-33) | Hurricane<br>Tropical storm<br>Major storm<br>Wind event<br>Temperature event | Modernization | $18.4 | $2.0 | $20.4 | 10.8 |
| Weather Stations (RM-34) | Hurricane<br>Tropical storm<br>Major storm<br>Wind event<br>Temperature event | Modernization | None | $0.3 | $0.3 | N/A* |
| Wildfire Cameras (RM-35) | Wildfire | Wildfire; Modernization | None | $0.9 | $0.9 | N/A* |
| **Total** | | | **$37.8** | **$34.4** | **$72.2** | **10.8** |

*Note: Please see Section 5 of Exhibit EE-2 for a qualitative benefit analysis of this Resiliency Measure.

My testimony first provides a general overview of the climate and weather-related risks faced by the Greater Houston area and the granular and risk-based analysis used by the Company to determine the Resiliency Measures to include in the Company's SRP. I also discuss the Company's vegetation management and wildfire mitigation strategies.

# I. INTRODUCTION

**Q. PLEASE STATE YOUR NAME AND CURRENT POSITION.**

A. My name is Eric D. Easton. I am employed by the Company as Vice President of Electric Grid Transformation and Investment Strategy.

**Q. PLEASE SUMMARIZE YOUR EDUCATIONAL AND WORK BACKGROUND.**

A. I received a Bachelor of Science degree in Electrical Engineering from Prairie View A&M University, a Master of Business Administration degree from the University of Nebraska at Omaha, and a Doctoral of Philosophy degree in Systems Engineering from Texas Tech University. I have over 20 years of electrical engineering and operations experience, including over 15 years of experience with and varying positions within the Company. My positions within the Company have included Engineer and Senior Engineer in Real Time Operations, Lead Engineer in Transmission System Protection, Consultant in Asset Management, Manager in Substation Projects, Director of Real Time Operations, and Vice President of High Voltage and Real Time Operations. In my prior position as Vice President of High Voltage and Real Time Operations, I oversaw the field operations (i.e., construction, replacement, maintenance) and real time operations (i.e., command and control) of the Company's transmission system.

I was appointed to my present position in January 2023, at which time I assumed responsibility for devising and implementing strategies related to the modernization, automation, potential transformation, and resiliency of the Company's transmission and distribution system. I was involved in the

development of both the Company's 2025-2027 T&D SRP filed in Commission Docket No. 56548 and the Company's 2026-2028 T&D SRP that is being submitted for Commission review and approval.

**Q. DO YOU HOLD ANY PROFESSIONAL LICENSES OR CERTIFICATES?**

A. Yes. I am a registered Professional Engineer in the state of Texas. Additionally, during the course of my employment with the Company, I have invented four (4) patents: Substation Electromagnetic Mitigation Module (US 10,856,453, issued December 1, 2020); Electromagnetic Mitigation Modules for Public Utility Facilities (US 11,224,150, issued January 11, 2022); Substation Electromagnetic Mitigation Module Housing Input/Output Device (US 11,284,545, issued March 22, 2022); and Substation Electromagnetic Mitigation Module (US 11,350,548, issued May 31, 2022).

**Q. WHAT ARE YOUR CURRENT RESPONSIBILITIES AT THE COMPANY?**

A. As Vice President of Electric Grid Transformation and Investment Strategy, I oversee the planning and designing of the Company's transmission and distribution system, including:

- The development and implementation of the Company's capital program;
- Hardening, modernization, automation, and other resiliency-related investments;
- Asset strategies for high-voltage assets (i.e., transmission), low-voltage assets (i.e., distribution), and substation assets;

- Managing the forecast of and adaptation to transformative challenges such as rapid and large load growth, DERs, EVs, and other forms of electrification;[1]
- Project management; and
- Modeling of Resiliency Events.

My organization has approximately 120 employees that are responsible for the development and execution of grid transformation, investment strategy, and planning and design related to the Company's transmission and distribution system. Additionally, my organization manages approximately 40 external contractors that provide services to the Company.

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

A. I am testifying on behalf of the Company.

**Q. HAVE YOU TESTIFIED PREVIOUSLY?**

A. Yes. I have filed testimony with the Commission in Docket Nos. 56211 and 54830.

**Q. WHAT EXHIBITS HAVE YOU INCLUDED WITH YOUR TESTIMONY?**

A. I have included the one exhibit listed in the Table of Contents as part of my testimony.

**Q. WAS YOUR TESTIMONY PREPARED BY YOU OR BY OTHERS WORKING UNDER YOUR DIRECTION AND CONTROL?**

A. Yes.

[1] Refer to the Direct Testimony of Nathan Brownell for further discussion on load growth, EVs, and electrification.

## II. OVERVIEW OF TESTIMONY

**Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY AND HOW IS IT ORGANIZED?**

A. There are six operations witnesses – Mr. Deryl Tumlinson, Mr. David Mercado, Mr. Randy Pryor, Mr. Ronald Bahr, Mr. Christopher Ford, and me – addressing the following subjects.

**Figure EE-2**

**Operations Witnesses and Corresponding Testimony Subjects**

| **Witness** | **Subject of Testimony** |
|---|---|
| Mr. Deryl Tumlinson | Overhead Distribution System |
| Mr. David Mercado | Transmission System and Substations |
| Mr. Randy Pryor | Strategic Undergrounding and Vegetation Management |
| **Mr. Eric Easton** | **Damage Prediction, Use of Advanced Analytics, and Wildfire Mitigation** |
| Mr. Ronald Bahr | Information Technology |
| Mr. Christopher Ford | Cybersecurity Operations |

My testimony first provides a general overview of the climate and weather-related risks faced by the Greater Houston area, and the granular and risk-based analysis used by the Company to determine the Resiliency Measures to include in the Company's 2026-2028 T&D SRP. With this context in mind, my testimony then describes how the Resiliency Measures in the Company's 2026-2028 T&D SRP are grouped and presented on an event basis rather than a category basis; how