Control Number: 32182

Item Number: 88

Addendum StartPage: 0

PROJECT NO 32182

PUC INVESTIGATION OF METHODS TO IMPROVE ELECTRIC AND TELECOMMUNICATIONS INFRASTRUCTURE TO MINIMIZE LONG TERM OUTAGES AND RESTORATION COSTS ASSOCIATED WITH GULF COAST HURRICANES

STAFF REPORT

July 28, 2006

TABLE OF CONTENTS

88

Acknowledgements

Staff would like to thank all of the companies, organizations, and elected officials that participated in this project through their written comments and attendance at the public meetings and workshops.

Telecommunication

Alltel
AT& T Texas
Sprint
Texas Statewide Telephone Coop, Inc.
Verison Southwest

Electric

AEP Texas companies
Bowie-Cass Electric Coop
Cap Rock Energy
CenterPoint Energy
Concerned Citizens of Waco
East Texas Electric Coops
El Paso Electric Company
Entergy Gulf States Inc.
Fayette Electric Coop
LCRA Transmission Service Corp.
Magic Valley Electric Coop
Medina Electric Coop
Mid-South Synergy
Public Utility Board of Brownsville
Rusk County Electric Coop
San Patricio Electric Coop
Sharyland Utilities
Texas-New Mexico Power Company
TXU Electric Delivery
TXU Steering Committee of Cities
Xcel Energy

Elected Officials

Rudy Villarreal, Mayor, City of Alamo
Jessica Chakar representing Houston Council Member Addie Wiseman
Tyler Norman representing Houston Council Member Shelley Sekula-Gibbs, M.D.
Eddie Arnold, Jefferson County Commissioner, Precinct 1
Terry Simpson, County Judge, San Patricio County
Gail Hiller representing Harris County Commissioner Sylvia R. Garcia
Mike Hamilton, State Representative, District 19
Tony Ramirez representing State Representative Juan Escobar, District 43
Rita Ashley representing State Senator Tommy Williams, District 4
Sylvia Ramirez representing Congressman Solomon Ortiz, District 27
Chad King representing Congressman Ted Poe, District 2

I. EXECUTIVE SUMMARY AND RECOMMENDATIONS

The purpose of this Hurricane Infrastructure Investigation is to identify ways to improve electric and telecommunications infrastructure, and to minimize the utilities' downtime occurring as a result of Gulf Coast hurricanes. To accomplish this, the Public Utility Commission's (PUC's or Commission's) staff (Staff) conducted industry workshops at the Commission and town hall meetings in the Houston, Beaumont and Corpus Christi areas. In the course of these workshops and meetings, the Staff obtained input from telecommunications and electric utilities as well as interested parties. Staff focused on information related to the utilities' historical experiences with storm aftermaths and the utilities' resulting long-term and short-term plans for infrastructure improvements to address these situations. This report summarizes damages and operational issues sustained by electric and telecommunications utilities during, and after, the occurrence of Hurricane Rita and provides the utilities' recommendations, including suggested cost recovery mechanisms.

The electric and telecommunications utilities generally agreed that damage to above-ground distribution facilities from hurricanes, and high-wind events, resulted primarily from the impact of trees and flying debris. Damage to substation equipment was primarily the result of flying debris (including limbs and portions of trees) but occasionally it was the result of flooding.

Most electric and telecommunications utilities in Texas have some outside plant structures or facilities that were designed and built according to now outdated wind loading standards. Because of the severity of hurricanes, Staff believes that upgrading structures and facilities along the Texas coastline to a specific wind loading standard will improve the likelihood that infrastructure will be able to withstand severe weather events. Staff recommends that all applicable utilities provide the Commission with reports that detail the amount of facilities within 50 miles of the Texas coastline and provide projections on the costs and time required to upgrade these facilities to meet current National Electrical Safety

Code (NESC) standards. The following summary provides Staff's recommendations for reducing future outage durations and associated restoration costs due to hurricanes or similar high-wind events throughout the state.

Although the initial focus of this investigation was on damage caused by Hurricane Rita and subsequent restoration of service, the information received from the utilities raised issues of broader concern about service reliability and storm restoration for all the utilities in Texas. Therefore, Staff is including in this report recommendations that, if adopted, would have state-wide applicability.

Summary of Staff Recommendations:

After consideration of the information provided during the investigation, Staff developed recommendations intended to improve reliability and storm restoration. Most of the recommendations would require adoption of rules. As part of the rulemaking process, additional information about the costs of complying with more stringent requirements would be obtained, and additional cost-benefit analysis would be performed. We would expect broader participation by interested parties, who would have the opportunity to comment on specific rule language.

The recommendations are primarily directed at vegetation control, facilities maintenance, and system design elements that would decrease the probability of damage due to high winds and flooding. Additional details about the recommendations are provided at the conclusion of this report.

Recommendations Applicable to Coastal Areas

- All telecommunications utilities' central offices in hurricane-prone areas should be capable of full operation without interruption for at least 72 hours after loss of electric utility power.

- All permanent new and replacement transmission structures installed within 10 miles of the Texas coastline should be designed to meet the current NESC wind loading standards assuming a maximum wind speed of 140 miles per hour. The rulemaking should also explore whether all permanent new and replacement transmission structures installed within 50 miles of the Texas coastline should be constructed to meet the current NESC wind loading standards.

- Each electric utility that owns transmission facilities located within 50 miles of the Texas coastline should be required to provide to the Commission information about each transmission line, including an estimate of the cost to upgrade facilities to withstand higher wind velocities.

Recommendations Applicable Statewide

- Each electric and telecommunications utility should have an on-going vegetation management program addressing all overhead facilities/lines.

- Each electric and telecommunications utility should be required to develop and implement an on-going, cyclical, ground-based inspection program for its overhead facilities.

- Electric utilities should be required to design and construct all new substations located within a 100-year floodplain so that the floor of the control house and all water-sensitive components of the substation operating equipment are above the elevation of the 100-year floodplain.

- Electric and telecommunications utilities should be required to conduct inspections (during the utility's regular, ground-based inspection cycle) of overhead facilities to determine whether the equipment located on those facilities, but not owned by the utility, is causing an overload on those structures.

- Electric and telecommunications utilities should be required to develop requirements, to be incorporated into existing "pole attachment" contracts and tariffs that ensure the structural integrity of the utility's overhead facilities in situations where other parties attach cables or other facilities.

- The Commission should consider establishing incentives that encourage electric utilities to modernize their electric grids through the deployment of intelligent devices on the network.

- Electric utilities should work with developers and homeowners to establish buffer zones around underground facilities in which no trees or structures will be placed to ensure access to the facilities for any future repair work.

- To the extent it is not prohibited by city ordinances, electric utilities should encourage developers of new residential properties to utilize underground distribution facilities and should encourage location of these facilities in front of homes or in accessible alleyways.

II. HURRICANE RITA OVERVIEW – SUMMARY OF EVENTS

Prior to Landfall

On September 19, 2005 the PUC emergency management response team sent out a mass email to all utilities in Texas asking them to review their emergency plans, check inventories, and prepare their crews for Hurricane Rita. All of the major utilities along the coast responded promptly with a summary of their emergency plans. All of the companies had crews prepared, inventories stocked, and generators gassed up, in addition to activating their emergency centers.

Landfall

Hurricane Rita made landfall in the early morning hours of September 24, 2005 in the Beaumont/Port Arthur area as a strong category 3 hurricane. This was less than one month after Hurricane Katrina made landfall in the New Orleans area as a category 4.

Outages

At the outage peak, 1,500,244 customers in Texas were without power. Power was declared to be fully restored in Texas on October 8, 2005. See Attachment 1. Some customers remained out of service until October 15, 2005.

CenterPoint Energy had largest number of outages with approximately 719,000 customers out of service at the peak. Entergy Gulf States and the East Texas Electric Cooperatives suffered the greatest damage to infrastructure and other facilities and a vast majority of their customers were out of service at some following Hurricane Rita.

Presidential Visit

On September 24, 2005, President George W. Bush stopped by the State Operations Center to discuss Hurricane Rita restoration efforts and to thank the state and federal employees working in the SOC on Hurricane Rita restoration.

Tiger Team

On September 26, 2005 Jack Colley, Chief of the Division of Emergency Management, appointed a "Tiger Team" to coordinate the electric service restoration effort. The Tiger Team was headed up by David Featherston, Infrastructure Reliability Division - PUC, and David Abernathy, Texas Forest Service, and consisted of representatives from Entergy, CenterPoint, AEP, TXU, the Department of Energy (DOE), FEMA, and the Corps of Engineers. The goals of the Tiger Team were to expedite the restoration effort and to help facilitate coordination between electric utilities.

The Tiger Team through its coordinated efforts helped shorten the outage duration from an original estimate of eight weeks to approximately three weeks. However, this restoration could not have been accomplished without the 10,000 line workers, tree trimmers, and logistic support staffers, many of whom traveled hundreds of miles and worked around the clock.

Eminent Domain Order from Governor

On September 26, 2005, Governor Rick Perry issued an order allowing electric utilities to construct facilities over private land without the need to obtain an order of eminent domain from a court of competent jurisdiction.

Action of Public Utility Commission

The PUC voted on September 27, 2005 to allow electric utilities in the Electric Reliability Council of Texas (ERCOT) grid to provide service and construct facilities into the Entergy service territory. The order waived the service area certificate requirements and CCN certification requirements of the PUC to accomplish emergency work in the Entergy service territory.

Action of Department of Energy (DOE) and Federal Energy Regulatory Commission (FERC)

DOE issued an order on September 28, 2005, allowing the ERCOT utilities to provide service into the Entergy service territory without being subject to FERC jurisdiction. The order declared that an emergency existed and power could be interconnected between the regions without the ERCOT utilities becoming "public utilities" as defined by Federal law.

PUC EMRT

The PUC emergency management response team (EMRT) logged over 750 hours on Hurricane Rita restoration efforts. This was the largest restoration effort in the Commission's history.

PUC EMRT After Action Recommendations:

- That EMRT staffing of the SOC during hurricanes be increased to two members during daytime hours once landfall occurs. One staff member will continue to staff evening and overnight shifts.

- That the Tiger Team concept be continued. However, Tiger Teams should only be formed to address emergencies that are large scale and affect multiple utilities over an extended period of time.
- That the PUC staff open an investigation to determine what is the appropriate infrastructure to deploy in hurricane-prone areas. This investigation would look at the infrastructure that was in place prior to Hurricane Rita, what infrastructure was installed to restore service post Hurricane Rita, and what infrastructure should be installed in the future to prevent similar damage from future hurricanes. This investigation will also examine the costs of "hardening" the network and how it will be recovered. The Florida PSC has launched a similar investigation. On December 15, 2005, the Commission concurred with the Staff's recommendation to open this investigation and established Project No. 32182, *PUC Investigation of Methods to Improve Electric and Telecommunications Infrastructure That Will Minimize Long Term Outages and Restoration Costs Associated With Gulf Coast Hurricanes.*

III. HISTORICAL EXPERIENCE AND OPERATIONAL ISSUES

A. ELECTRIC UTILITIES

Over 1.5 million electric utility customers were affected by Hurricane Rita in east Texas. High winds broke electrical poles and forced debris onto conductors causing most of the outages. Storm surge along the Texas Gulf coast severely damaged electrical facilities.

Electric utilities utilized all available employees and received assistance from contractors and other utilities during the restoration. With the extensive

restoration, utilities identified some problems with communications and locating staging areas for crews.

AEP Companies (Southwestern Electric Power Company [SWEPCO], AEP Texas North Company [TNC] and AEP Texas Central Company [TCC])

At the peak of the storm, SWEPCO reported approximately 53 percent of its facilities, or 87,733 Texas customers, affected by the aftermath of Hurricane Rita. SWEPCO reported 11 transmission lines, out of a total of 91 transmission lines, sustained damage. SWEPCO reported three of its 69 kilovolt (kV) single wood poles were damaged.[1] SWEPCO reported 102 single wood distribution poles were damaged. SWEPCO reported 234 distribution circuits in Texas damaged, 85.71 percent of its total, and that none of its transmission or distribution substations sustained any damage.[2] The duration of SWEPCO's outages ranged from a minimum of 6 minutes to a maximum of 81 hours, with an average of 21 hours.[3]

SWEPCO identified three operational issues that would improve the restoration process in the future.[4]

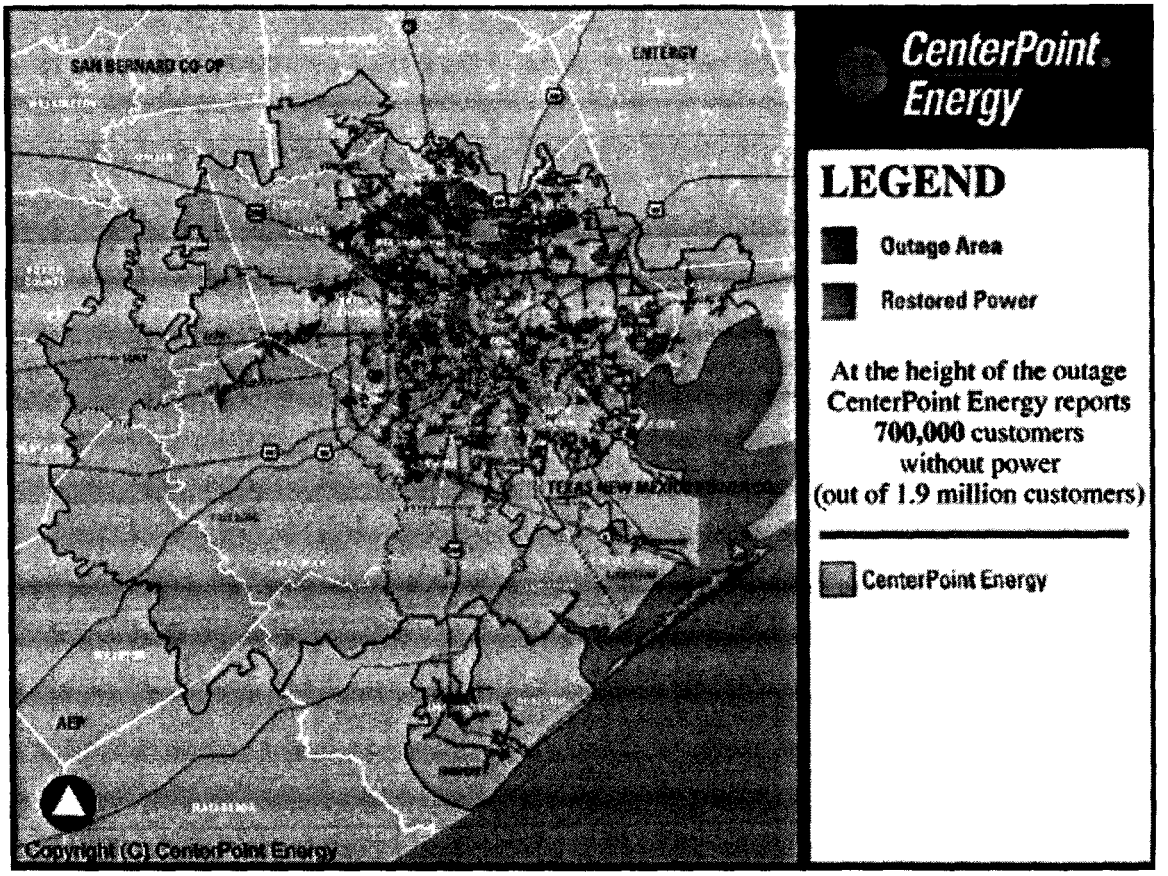
1. a need for more radios and monitors in its Distribution Dispatch Center;
2. a need to identify new staging areas which are not known Emergency Shelters; and
3. a need to assign additional employees to assist with logistical support, as well as the necessary training to accomplish this task during a major event.

[1] AEP Response to Question 1 in Section 2 of First RFI.
[2] AEP Response to Question 2 & 3 in Section 2 of First RFI.
[3] AEP Response to Question 1 in Section 1 of First RFI.
[4] AEP Response to Question 4 in Section 1 of First RFI.

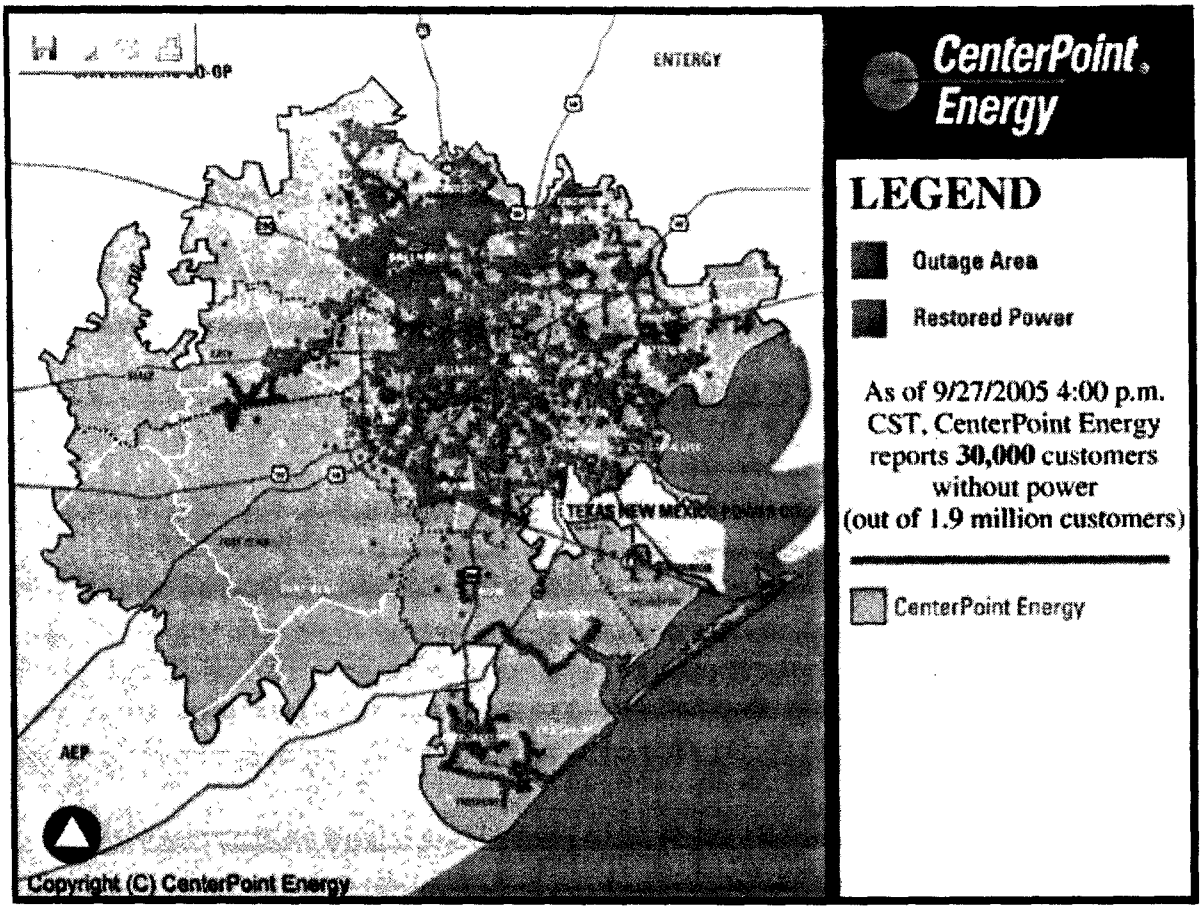
CenterPoint Energy (CenterPoint)

At the peak of the storm, CenterPoint reported 719,000 customers without service out of a total of two million customers. CenterPoint reported 639 circuits locked out, 45 percent of its total.[5] On its distribution system, CenterPoint reported 799 wood poles were down and 494 transformers were damaged.[6] Only one transmission structure had to be replaced and it was a 138 kV single wood pole.[7]

Of the 719,000 CenterPoint customers without power, 68 percent had power restored within one day and 95 percent were restored within 3 days. All power was restored in less than 6 days.[8]



[5] CenterPoint Response to Question 2 in Section 2 of First RFI.
[6] CenterPoint Response to Question 3 in Section 1 of First RFI. (amended)
[7] CenterPoint Response to Question 1 in Section 2 of First RFI.
[8] CenterPoint Response to Question 1 in Section 1 of First RFI.



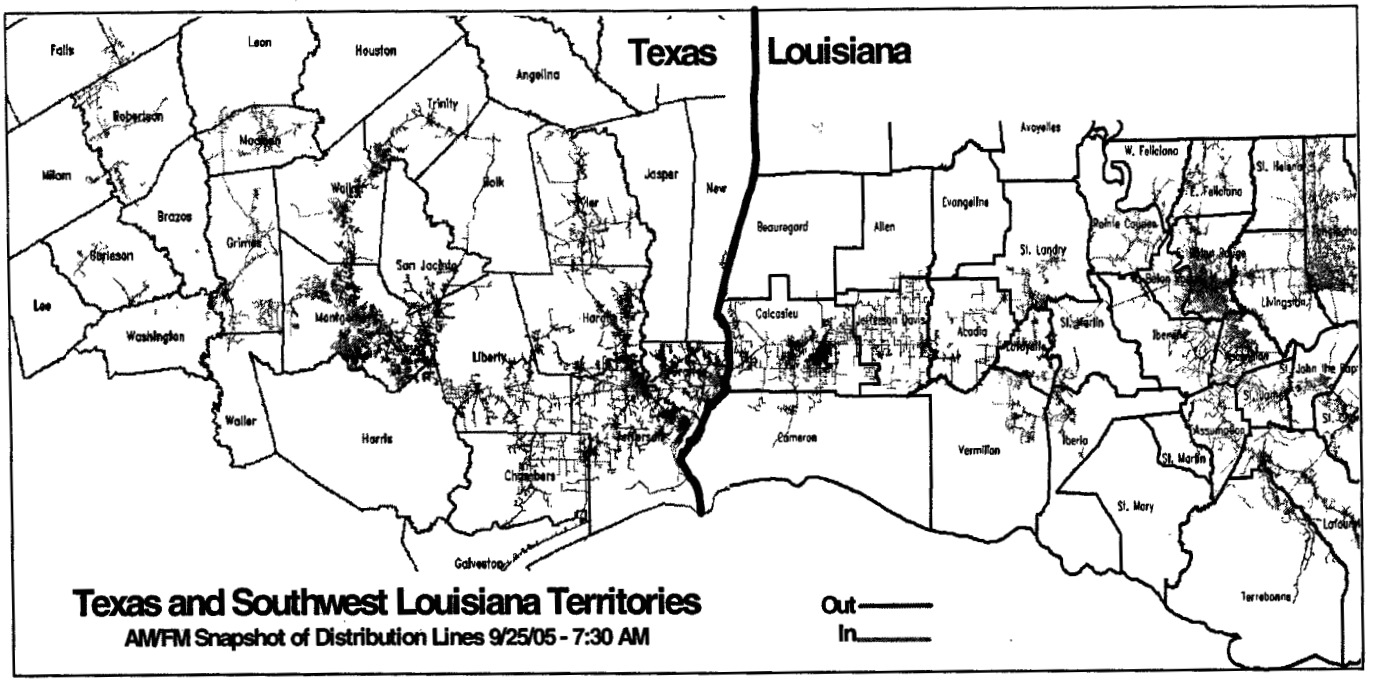
CenterPoint identified 230 lessons learned to improve the Emergency Operation Plan in its after action plan. In addition, CenterPoint realized that optimum facility locations for its command center post and dispatching must be re-evaluated and identified considering the impact of a major storm. CenterPoint will work with the Cities and Counties to shape communications and mitigate negative public perception.

Entergy Gulf States (EGSI)

Hurricane Rita was the second biggest storm in EGSI's history and it wreaked havoc across a huge swath of EGSI's service territory. At peak, EGSI reported 766,410 customers were out of service with 286,609 of those customers located in Texas.[9] Heavy damage was sustained to the transmission and

[9] EGSI Initial Hurricane Report.

distribution systems, including 87 substations.[10] EGSI lost 8,970 distribution poles[11] in Texas with many of them broken in half by the high winds. All transmission connections from Louisiana to Texas were severed.



EGSI had 634 transmission structures that were damaged and needed replacement as follows:

286 single wood poles;
321 H frame, or multiple, wood pole structures;
26 lattice towers; and
1 concrete pole.[12]

Within one week after Hurricane Rita, EGSI had restored power to 39 percent of the 286,609 customers who were out at peak. By the end of week two, 85 percent were restored. By the end of week three, all customers that were ready

[10] EGSI Response to Questions 4 & 5 in Section 2 of First RFI.
[11] EGSI Response to Question 3 in Section 2 of First RFI.
[12] EGSI Response to Question 2 in Section 2 of First RFI.

to receive power were restored. Overall, approximately 13 percent of EGSI Texas customers had some level of damage.

EGSI learned that its logistical support was a bottleneck. Facilities to house restoration workers were either not available or very limited. Inventory levels were very low for both the utility and suppliers. EGSI also had difficulties with back-up generators for its field radio service and other communication problems.[13] EGSI concluded that its contractor and vendor lists need to be updated each year before the hurricane season.[14]

EGSI and CenterPoint used an unprecedented solution to provide a limited 138 kV transmission source to the Gordon substation that supplied power to the City of Houston water pumping stations on Lake Livingston. In order to get power from the CenterPoint system to the Gordon substation, CenterPoint had to repair the transmission facilities between EGSI's Dayton and Gordon substations. Before the line could be energized from CenterPoint's Crosby substation to EGSI's Dayton substation, approvals had to be obtained from the PUC, DOE, FERC, and ERCOT. This unique solution was also used for additional loads in the Southeast areas of the Texas service territory. In addition, EGSI worked closely with TXU and the Coops to switch some of the Jasper-Newton Coop loads from Entergy to TXU during the restoration. This flexibility helped speed restoration to the northern portion of the Texas service territory.[15]

TXU Electric Delivery (TXU)

TXU reported damage to transmission and distribution facilities resulting in 238,280 customer outages in the Dallas/Fort Worth area and further east, near Texas' border with Louisiana. TXU's affected facilities included 358 poles, 505 cross arms, 3,321 spans of wire, and 333 transformers. TXU reported that twelve transmission structures needed either repair or replacement. None of TXU's transmission or distribution substations sustained any damage. TXU also provided assistance to Jasper-Newton Electric Cooperative and Entergy. A 12

[13] EGSI Response to Question 9 in Section 2 of First RFI.
[14] EGSI Response to Question 4 in Section 1 of First RFI.

mile, 138 kV, transmission line from Huntington-Etoile was restored so that 6,500 customers of Deep East Texas Coop and Jasper-Newton Coop could have service.[16]

Approximately 238,280 TXU customers were affected. The outage time ranged from momentary to 135 hours (5.6 days) with an average of approximately 17 hours.[17]

Based on its storm experience, TXU sees a need to improve its logistics with contractors, improve training of its non-field personnel for customer contact, and develop a computer-based personnel tracking system.[18]

Bowie-Cass Electric Cooperative, Inc. (BCEC)[19]

BCEC experienced limited infrastructure damage but approximately 41 percent of its customer base experienced outages as a result of the storm. BCEC provided the following breakdown of affected infrastructure:

	Total	Damaged/Affected
Customers	34,750	14,434
Transmission lines	32	1
Transmission structures	2598	1
Transmission substations	5	0
Distribution feeders	108	5
Distribution structures	113,794	12
Distribution substations	26	0

East Texas Electric Cooperatives (ETC) [20]

ETC consists of three distribution cooperatives that own and operate about 300 miles of transmission lines and about 15,000 miles of distribution lines. ETC

[15] EGSI Initial Report on Hurricane Rita.
[16] TXU Initial Hurricane Report.
[17] TXU Response to Question 1 in Section 1 of First RFI.
[18] TXU Response to Question 3 in Section 1 of First RFI.
[19] Bowie-Cass Response to First RFI.

advised that 99 percent of its distribution feeders and about 11 percent of its transmission facilities were damaged. The outage time for the cooperatives' customers ranged from 16 hours to 864 hours (36 days) with an average of 263 hours (11 days).[21] ETC provided the following breakdown:

	Total	Damaged/Affected
Customers	123,733	105,905
Transmission lines	35	19
Transmission structures	*[22]	60
Transmission substations	2	0
Distribution feeders	108	5
Distribution structures	113,794	12
Distribution substations	48	6

ETC learned that the restoration of the communication system was essential after the storm had passed. Three other key improvements were identified by the cooperatives: (1) need for rapid assessment; (2) develop a better crew tracking system, and (3) explore options to better disseminate information to the membership concerning status of restoration.[23]

B. TELECOMMUNICATIONS UTILITIES

Telecommunications utilities operating in the Houston, Beaumont, and Sabine Pass areas reported wide spread damage to distribution facilities due to Hurricane Rita. The distribution facilities for telecommunications utilities included outside aerial cable plant, including poles and attachments, digital remotes located on the ground and certain central office (CO) facilities.

Telecommunications utilities identified certain operational issues relating to logistics, work coordination, commercial power and generator fuel availability

[20] Tex-La Electric Cooperative of Texas, Deep East Texas Electric Cooperative, Inc, Jasper-Newton Electric Cooperative, Inc. and Sam Houston Electric Cooperative, Inc.
[21] ETC Response to Question 1 in Section 1 of First RFI.
[22] ETC did not provide the total number of transmission structures.

and transportation. The companies provided information on service restoration activity, identifying whether the plant material acquisition was through existing inventory or new purchase.

The company specific damage and service restoration data as reported are listed below in addition to the conclusions of the three major carriers in the storm area.

Alltel

Alltel advised that its Winnie, Texas CO suffered minor roof damage. Alltel noted that some unused aerial cable was removed and not replaced after the storm. Alltel also provided the following statistical data:

- 27 single and joint service wooden poles were replaced;
- 374 feet of aerial cable were replaced;
- 10,132 feet of aerial cable were replaced with buried cable.

Alltel concluded the following:

- Need more gensets.
- Determined that underground facilities were preferable to aerial facilities within storm areas.
- Fueling of gensets and vehicles proved problematic due to mass evacuation from Houston.
- Need for systems and processes to ensure local management structure and track employees during evacuations

AT&T

AT&T reported that 90,000 customers were affected (of these, 75,249 actually reported trouble). AT&T advised that there were forty COs in the affected area and only one, in Sabine Pass, was destroyed by storm surge. However, 24 percent of AT&T's facilities in the service area were affected. AT&T reported that, shortly after landfall, 108 COs required back-up power. Of these, 64 COs outside the primary area were restored within a few days. Forty-four COs required back-up power and the commercial power was restored by

[23] ETC Response to Question 4 in Section 1 of First RFI.

October 13, 2005. AT&T further noted that only four (located in Vidor and Nacogdoches) of the 2,114 remote terminals in the area had to be replaced and that these were installed by October 6, 2005.

AT&T advised that cellular service was diminished during the first week, making communications with field personnel difficult, and that it outsourced services for engineering, tree trimming, placement and removal of poles, cables, generator delivery, food services and security and used established engineering standards for all plant construction. The service restoration interval ranged from 18 hours to 22 days with the exception of one neighborhood that was out of service for 67 days, due to a re-build of the plant for that entire neighborhood.

AT&T also provided the following statistics:

- 700 wood poles were damaged and had to be replaced out of a total of 53,314 wood poles in the affected area.
- 2,662,614 sheath feet of cable had to be replaced out of a total of 12,211,990 sheath-feet of cable in the primary area affected by Rita.
- 633 remote terminals required back-up power.
- 100 percent of the material used for restoration was newly acquired.

AT&T concluded that three areas must be addressed prior to another hurricane season:

- Improvement of damage assessment using facility maps (GIS) rather than narrative descriptions.
- Better briefing of DAT teams prior to deployment.
- Pre-storm coordination with power utilities.

Sprint

Sprint simply stated that it required $678,000 in capital for cable, poles and miscellaneous items to restore its services and that the cost for labor and materials was $$260,000.

Sprint determined that buried facilities would reduce the cost of future restorations and that its deployment of generator sets (gensets) and fuel were hampered by access problems.

Verizon

Verizon noted that it has a detailed emergency management plan whereby its resources across the country could be called upon as needed. Verizon advised that 281 poles, 227 terminals, 3 repeaters, 1 C/O (roof), 834 cables, and 324 drop wires required repairs or replacements as a result of the storm. Verizon stated that 85-90 percent of the necessary materials for these repairs came from inventory, with 10-15 percent requiring newly purchased materials. The exception to this was the replacement of a CO roof, which required all new materials. Verizon also noted that existing standards were met in all repair cases and that it replaced 15-20 percent of its aerial lines with underground cable after the storm.

IV ELECTRIC AND TELECOMMUNICATIONS INFRASTRUCTURE ISSUES

A. ELECTRIC UTILITIES

AEP Companies (Southwestern Electric Power Company [SWEPCO], AEP Texas North Company [TNC] and AEP Texas Central Company [TCC])

Much of the damage sustained in SWEPCO's territory was the result of fallen trees and flying debris from damaged buildings, business signs and other non-secured items during and after Hurricane Rita.

The AEP Companies advised that they could upgrade their facilities' infrastructure to standards that exceed those of the NESC. However, AEP does not believe that building its facilities to a higher standard or even burying electric distribution and transmission facilities would substantially mitigate damage or

improve restoration times. Nevertheless, for the transmission system, AEP suggests the rebuilding or upgrading of the 138 kV and 69 kV lines within the coastal region that were built before 1970 because they do not meet the design criteria to withstand 140 mph winds. Preliminary estimates indicate that AEP would need to fund approximately $966 million dollars to rebuild or upgrade the estimated 1,000 miles of 138 kV and 69 kV lines of pre-1970 vintage.

AEP Companies also suggested that it may be possible to strategically upgrade substations and lines in order to withstand multiple outages that would be caused by a hurricane. Locating new transmission corridors away from existing corridors improves the potential reliability of the system serving a particular area.[24]

AEP does not have a detailed strategy for hardening the electrical distribution system against hurricanes, but advised it continuously endeavors to improve its distribution system for the purpose of providing a safe and reliable delivery of electricity. AEP noted that it is difficult to establish an infrastructure hardening plan without a complete and thorough understanding by all concerned regarding the standards to be adopted, the costs associated with such efforts, and a plan to fund and subsequently recover the cost for the hardened infrastructure.[25]

AEP provided the following potential "infrastructure hardening" efforts with estimated costs[26]:

1. Replace existing distribution poles within 30 miles of the coast to the Extreme Wind velocity zone criteria (estimated cost: $200 million).
2. Replace entire overhead electrical distribution infrastructure within 30 miles of coast (estimated cost: $500 million).
3. Replace existing distribution wood structures with steel (estimated cost: $300 million).

[24] AEP Response to Second RFI, Part IIe, Bates page 9.
[25] AEP Response to Second RFI, Part III, Bates page 9-10.
[26] AEP Response to Second RFI, Part III. Bates page 11-14.

4. Replace existing distribution wood structures with steel and replace transformers, wire, etc. (estimated cost: $600 million).
5. Conversion of overhead distribution within 30 miles of coast to UG (estimated cost: $4 billion).

TCC believes that increases in transmission invested capital for the "hardening" of facilities qualify for treatment under the interim transmission cost of service (TCOS) mechanism for transmission companies. TCC believes a review of the Commission's rule may be appropriate to ensure recovery of these investments.[27]

TCC noted that distribution investments can now only be recovered through a general rate case proceeding. Given the significant investments that could be required by a change in distribution design requirements, TCC supports the development of an alternative regulatory mechanism that would allow for more timely recovery of incremental distribution costs. TCC asserted that there are several general types of cost recovery mechanisms that could be applied to distribution investments. Some examples include:

1. adapting the TCOS and/or Transmission Cost Recovery Factor (TCRF) mechanism to apply to distribution investments;
2. implementing a mechanism similar to the Gas Reliability Infrastructure Programs, a mechanism currently in use at the Railroad Commission of Texas for gas distribution utilities, to seek recovery of incremental investment costs;
3. a band-width mechanism that would consist of periodic (most likely annual) filings with the PUC that allow rate adjustments if a distribution utility's return on equity is determined to be outside a preset bandwidth; or,
4. a separate rider to a distribution utility's tariffs to allow recovery of incremental investment costs that are designed to harden the infrastructure (an example of this last option is the Public Service

[27] AEP Response to Second RFI, Part V, Bates page 15-16.

Company of Oklahoma's "Reliability Rider," which allows recovery of incremental costs associated with tree trimming expenses and investments in underground facilities).[28]

CenterPoint Energy (CenterPoint)

CenterPoint suggested certain modifications can be implemented on an electric delivery system to address the wind effects of the landfall of a Category 4 hurricane. However, these modifications are not included in any current CenterPoint plans. In addition, CenterPoint believes that the benefits from any modifications to the system will not be realized for several years. Therefore, until there is sufficient saturation of the modifications throughout the system, outage impacts and restoration times will not be significantly affected. The estimated total annual cost to make these modifications to the transmission system is $9.1 million, with a one time cost of $5.1 million. CenterPoint's suggested delivery system modifications and their estimated costs are:

1. Replace strategic wood transmission structures (annual cost: $3.5 million).
2. Replace strategic existing freeway crossings with underground facilities (annual cost: $2.5 million)
3. Install new freeway crossings underground (annual cost: $1.5 million).
4. Design new overhead transformers for installations that are larger than 3-167kVA, with pad-mounted transformers (annual cost: $1.1 million).
5. Additional use of insulated covering to protect strategic substation buses from debris (annual cost: $0.5 million).
6. Expand availability of strategic spares for substation equipment (cost: $5.1 million).[29]

[28] AEP Response to Second RFI, Part V, Bates page 16.
[29] CenterPoint Response to Question 1 & 2 of Second RFI.

CenterPoint's suggested distribution modifications and their estimated total annual costs are:

1. Design strategic new distribution feeder poles to extreme wind loading (annual cost: $3.4 million).
2. Modify the ground line treatment program for the distribution system to a ten year cycle (annual cost: $3.8 million).
3. Increase the distribution tree trimming budget by 25 percent (annual cost: $4.8 million).
4. Mandate other utilities in the Houston area to perform ground line treating equivalent to CenterPoint Energy's program for joint use facilities. (annual cost for CenterPoint: $1.8 million).
5. Expand the area rehabilitation program for the distribution system (annual cost: $1.5 million).
6. Expand the availability of strategic spares for substation equipment (One-time cost: $5.1 million).[30]

CenterPoint suggested three methods in which a transmission distribution utility (TDU) could be allowed to recover costs identified with "hardening" the transmission and distribution system in a timely way. These methods are; self-insurance, a Commission authorized rider, and an interim TCOS update. CenterPoint asserted that the current level of self-insurance reserve recovered through a TDUs' rates is not sufficient to cover the costs of significant events.

CenterPoint stated that the Commission has the discretion to consider the recovery of major storm damage replacement and repair costs without the need for the TDU to file a complete rate proceeding. Costs associated with major storms are maintained in separate accounts; therefore, these costs are "an easily segregated expense component" from the other capital and operating expenses of the TDU. CenterPoint believes the Commission can review the costs in a docketed proceeding and such costs should be surcharged over a fixed time period for recovery.

[30] CenterPoint Response to Questions 1 & 2 of Second RFI.

CenterPoint also noted that the Commission's Substantive Rules allow for the annual update of the transmission rates to reflect changes in invested capital. CenterPoint argued that the cost of "hardening" would qualify for this annual update. However, this is only a partial solution, in CenterPoint's opinion, because the rule only addresses transmission capital costs and does not include transmission operating costs or any costs associated with the distribution function. CenterPoint suggested a rider, limited to its customers that could be used to recover the hardening of the distribution system.[31]

Entergy Gulf States (EGSI)

EGSI believes that adopting higher wind speed designs for transmission and distribution facilities may offer some hardening benefits but it will not provide significant protection against damage caused by flying debris, falling trees and objects located outside the ROW.[32] EGSI suggested the following:

1. Select upgrades to higher design wind speeds of targeted vintage transmission lines built under older codes in the coastal regions.
2. Systematic upgrades of vintage flood prone substations.
3. Programmatic conversion of wood substation and transmission line structures to concrete or steel construction.
4. Modify grid operations to ensure that at least one cycle of transmission aerial inspections are completed prior to June each year.
5. Develop a circuit criticality score for transmission lines that targets increased maintenance for those lines that impact the most customer load during an outage of that line.
6. Recommend a targeted approach for conversion of transmission and distribution lines to underground construction when appropriate.
7. Target dangerous trees outside of the ROW for removal.

[31] CenterPoint Response to Second RFI, pages 7-10.
[32] EGSI Response to Second RFI, page 4.

8. Widen the transmission line ROW.
9. Upgrade material and construction standards for greater wind resistance, flooding and corrosion protection, and increased lightning protection.
10. Upgrade to allow remote readying of substations for major storms.
11. Adopt "extreme wind" load design for new distribution construction located in specific targeted areas.
12. Select upgrades of targeted vintage distribution lines built under older codes in the coastal regions to higher design wind speeds.

EGSI advised that a study to estimate the costs for the strategies listed above is being conducted and is scheduled for completion on July 15, 2006. EGSI suggested that the Commission wait for the results of the study before mandating any specific hardening programs. EGSI believes that various components of each hardening program may be prudent for specific targeted areas, but not for all.[33]

EGSI also stated that it would like to see a declaration from the Commission that the hardening strategies proposed by EGSI, after being reviewed and accepted by the Commission, would be deemed prudent and recoverable through rates or riders in a timely fashion.[34]

TXU Electric Delivery (TXU)

TXU advised that it does not currently own infrastructure in the immediate Gulf Coast area. However, TXU stated that its network meets or exceeds all required NESC design standards for those areas in which it operates. In addition, as components of the infrastructure are repaired or replaced, they are done at current NESC standards. TXU asserted that hardening the system by such means as the installation of underground facilities, or the application of new design standards, which are more expensive, offers no certainty that lengthy outages will not occur when the weather events like the hurricanes of last summer are

[33] EGSI Response to Second RFI, page 5-7.
[34] EGSI Response to Second RFI, page 9.

experienced. TXU believes that design standards must also stand extensive review to ensure that unintended consequences do not compromise the design intent.[35]

TXU advised that it believes that a "one size fits all" solution may not work because of different levels of exposure to storm damage. TXU argued that property insurance reserves must be funded at a reasonable level and that, if the insurance reserve is not sufficient to recover the cost, a surcharge above a certain level may be needed.[36]

East Texas Electric Cooperatives (ETC)

ETC advised that it does not believe there is a cost-effective manner in which to "harden" facilities to ensure against outages during a major natural disaster such as Hurricane Rita. However, the ETC noted that it expects to reassess and revise, where necessary, its emergency action planning in order to have sufficient emergency restoration personnel, services and facilities in place, when possible, prior to another natural disaster.[37]

ETC also noted that any costs for "hardening" the system would be recovered from the members of its cooperatives with a uniform rate for all members. ETC believes that, if significant changes are mandated, funding for the changes should be made available to utilities from sources other than the utilities' ratepayers.[38]

B. TELECOMMUNICATIONS UTILITIES

Alltel

Alltel echoed Sprint's recommendations for more buried facilities and improved methods for the deployment of gensets and fuel. Alltel also recommended the establishment of systems and processes for local management

[35] TXU Response to Question 1 of Second RFI.
[36] TXU Presentation at Third Workshop.
[37] ETC Response to Question 1 of Second RFI.
[38] ETC Response to Question 9 of First RFI.

structure and tracking. Alltel has not provided input regarding cost recovery at this time.

AT&T

AT&T advised that it does not believe that buried cable facility is a panacea for the ills brought on by hurricanes. AT&T noted that it will continue to use aerial facilities if other utilities in the joint-use area use aerial facilities. AT&T advised that it will seek joint construction with other utilities for underground deployments. AT&T noted that it will use water resistant sealed plant to reduce dependency on air pressure and that it will improve its pole inspection and repair processes in the near and long term. Finally, AT&T stated that it will continue planning and design activity for outside plant to comply with NESC and Industry standards.

AT&T suggested that cost recovery for hurricane damage repair and reconstruction may need to be modeled upon the Florida legislative enactment that authorized a surcharge in that state. AT&T stated that the other mandated long term upgrade activities should be treated as cost of doing business.

Sprint

Sprint recommended more buried facilities and improved methods for the deployment of gensets and fuel. Sprint also recommended that cost recovery take place through existing rates.

Verizon

Verizon has not provided any input regarding cost recovery at this time but made the following suggestions:

- Use existing storm preparation plan, proactively acquire gensets.
- Sand bag and seal central offices and remote terminals.
- Replace aerial facilities with underground facilities where ROW allows (Verizon noted that this may not solve the problems associated with flooding).

V. STAFF FINDINGS

Hurricanes Katrina and Rita brought to everyone's attention the destruction that can occur from hurricanes. This destruction and subsequent restoration identified the need to look at what could be done to lessen the impact of hurricanes and major storms and to improve restoration. Staff requested information from utilities and government officials and from the general public in three coastal cities. After three public meetings, five workshops and four comment periods, Staff has identified what it believes to be the most critical and cost effective improvements that can lessen the destruction and thereby shorten restoration from the effects of hurricanes and major storms. The following discussion focuses on six specific technical areas which results in 12 recommendations. Two areas were seriously considered but in the final analysis, they were withdrawn either for cost or safety considerations.

Staff also realizes that the Commission has certain authority as provided by PURA and it must operate under this authority in the regulation of utilities. The Legal Background section discusses this point.

Cost recovery is a major concern to utilities when there is a discussion concerning changes to the physical plant or changes to operating and maintenance procedures. Many comments were made by utilities concerning the cost of proposed improvements and reporting requirements. Some utilities were unable to quantify the costs because of the extensive amount of time required to inventory its existing system to determine what would qualify for a particular proposed improvement. The Cost Recovery section addresses Staff's position on this subject.

A. TECHNICAL

Vegetation Management

Staff believes that vegetation management is a key component of any strategy to reduce the number and duration of outages caused by high-wind

events. Any management program must consider the types of vegetation to be controlled, the concerns of landowners, and the rights of the utility to implement a program. The ownership of the land in and near the right-of-way (ROW) should also be considered.

Staff believes that ROW under the control of the utilities must be clear of trees and obstructive vegetation as much as possible to reduce the numbers and durations of outages and to allow timely and unhindered utility access to facilities during restoration activities. Staff also believes that removal of trees will be more cost-effective than periodic trimming, but staff realizes that trees are a valuable part of many neighborhoods and communities and that public resistance may prevent major trimming or complete removal. An approach that balances the needs of the utilities and the communities is the best course of action.

Facilities Operation and Maintenance

Staff believes that a regular inspection cycle for poles and overhead facilities is necessary to ensure that the facilities are maintained in a manner that will provide a reasonable level of service to the customers. It does not matter if a wood pole is designed to withstand winds of 140 miles per hour if it is rotted at the bottom.

The ability to communicate is an essential component of any restoration process after a major storm. Therefore, Staff believes it is prudent management for telecommunications utilities to ensure that all central offices in hurricane-prone areas be capable of full operation without interruption for at 72 hours after loss of electric utility power. On-site fuel storage may not be the most effective and reasonable solution so other alternatives need to be considered.

Staff believes utilities should use the latest, proven communication and monitoring technology to enhance the operation and maintenance of the transmission and distribution systems.

Transmission Structures

Staff believes that upgrading lines to a higher wind loading standard along the Texas coastline will mitigate future damage and improve restoration time. The estimated costs of upgrading transmission lines should be identified to determine if it would be cost effective.

Staff believes the effort to strengthen facilities should be focused along the Gulf Coast where major storms are more likely and where wood structures deteriorate more quickly than in other parts of the state.

Staff has noted that wood pole structures can be constructed that are as strong as concrete and steel structures and that costs should be a consideration in the final selection of the type of structures used. Also, Staff believes that to maintain the life of wood structures comparable to the lives of steel and concrete structures, effective inspection and maintenance programs of wood structures are imperative.

Substation Construction

Staff believes that, if it is determined by the utility that the most suitable location of a new substation is within a 100-yr floodplain, the utility should ensure that any potential flooding will not impact the operating equipment. Raising the control house and other essential equipment to an elevation above the floodplain will improve the reliability of the substations during major rainfalls.

Underground Facilities

Since wind and flying debris caused a majority of the damage during Hurricane Rita, Staff believes that underground facilities will provide better and more reliable long-term service to residential customers. However, underground facilities generally cost 5 to 10 times more than overhead facilities and may not protect against storm surge. In addition, in some cases involving flooding underground facilities may take longer to restore than overhead facilities.

Underground electric facilities serving residential subdivisions are normally placed at the rear of the lots because of the above-ground transformer

facilities are considered unsightly. However, access to these transformers when repairs are necessary is essential. Therefore, Staff concludes that utilities and customers would benefit if utilities proactively work with developers and homeowners to ensure that everyone involved in new residential developments understands the need to provide access to underground electric facilities.

Pole Attachments

Electric and telecommunication utilities have contracts to address pole attachments as required by the Federal Telecommunication Act, but some additional state rules are needed to maintain integrity. Utilities that do not own the poles to which they attach their facilities do not always inform the pole owner when attaching additional facilities. These additional facilities place an undue stress on the pole, overloading the pole and making it more likely to fail during a storm. Periodic inspection of the facilities must be part of any new procedure. Utilities are performing some inspections,[39] but staff believes a uniform procedure should be established to assure every utility is consistently and regularly performing inspections.

B. LEGAL BACKGROUND

Regulatory Power of Commission

The Public Utility Regulatory Act, TEX. UTIL. CODE ANN. §§ 11.001-66.017 (Vernon 1998 & Supp. 2005)(PURA) gives the Commission broad powers to protect the public interest and assure that the rates, operations and services of public utilities are just and reasonable to the consumers and the utilities.[40] The Commission possesses the general power to regulate and supervise the business of each utility within its jurisdiction[41] including the power to make and enforce rules[42] and require reports.[43]

[39] Murphy for CPE, transcript Bates 68, workshop 6-15-06.
[40] PURA §§ 11.002 and 11.008.
[41] PURA § 14.001.
[42] PURA § 14.002.

However, the jurisdiction of the Commission over municipally owned utilities and electric cooperatives is limited.[44] The recommendations in this report are not intended to apply to municipally owned utilities or electric cooperatives.

While the Commission does not have jurisdiction over local electric utility service within a municipality that has not surrendered jurisdiction to the Commission,[45] the municipality must exercise its jurisdiction "under the same standards and rules as the commission or under other consistent standards and rules."[46]

Electric utilities are required to furnish service and facilities that are safe, adequate, efficient, and reasonable, and the Commission has the authority to adopt just and reasonable standards an electric utility must follow in furnishing service.[47] In addition, electric utilities are required to provide continuous and adequate service, and any discontinuance, reduction, or impairment of service must be in compliance with and subject to any condition or restriction the Commission prescribes.[48]

P.U.C. SUBST. R. §25.101(d) currently applies certain standards and requires each "electric utility to construct, install, operate and maintain its plant, structures, equipment, and lines in accordance with" those standards.

To protect the public interest in having adequate and efficient telecommunications service available to each Texas resident at just, fair, and reasonable rates and via adequate and efficient services, the Commission has exclusive original jurisdiction over the business and property of a telecommunication utility in this state subject to certain limitations imposed by PURA.[49]

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[43] PURA § 14.003.
[44] PURA § 40.004 and 41.004.
[45] PURA § 33.004.
[46] PURA § 33.004(b).
[47] PURA §§ 38.001 and 38.002.
[48] PURA §§ 37.151(2) and 37.152(b).

Vegetation Management

This report identifies a significant problem: trees within and outside the right-of-way easement (ROW) can cause structural damage to the systems due to high winds. To help protect the systems, this report makes recommendations regarding removal and trimming of trees.

Within the ROW, the right to trim or remove trees will be governed by the terms of the easement,[50] but there is no right to trim or remove trees outside the ROW. To obtain that right, or to expand rights within the ROW, a utility would have to negotiate with the landowner or use its power of eminent domain.[51] The recommendations in Section VII regarding vegetation management recognize these legal constraints.

C. COST RECOVERY

The recovery of costs which result from implementation of the Staff's recommendations will depend somewhat on the amount of costs incurred by the utilities and that has not been determined. Both the electric and telecommunications utilities have several options for recovery of capital improvements and operating expenses.

The electric utilities in ERCOT could use the PUCT Sub R 25.192(g) and 25.193 to recover capital expenditures on the transmission system. For Non-ERCOT utilities, PUCT may develop a similar mechanism as defined by PURA Section 36.209[52]. Capital expenditures for distribution system along with operation and maintenance expenses for transmission and distribution could be recovered through the traditional rate case procedures. A surcharge or rider to recover specific expenses is another mechanism that could be used to recover costs for both electric and telecommunications utilities.

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[49] PURA §§51.001-52.002(a).
[50] *DeWitt County Electric Cooperative v. Parks,* 1 S.W.3rd 96 (Tex. 1999).
[51] TEX. UTIL. CODE ANN. §181.004.
[52] Entergy is not eligible for this cost recovery mechanism.

As to the issue of cost recovery, the Staff notes the following to address telecommunication utilities that are subject to different types of regulation under PURA.

a) Telecommunications utilities that are regulated under Chapter 53 of PURA may seek to recover the cost of implementing the recommendations through a rate case proceeding pursuant to PURA §§53.101 – 53.113.

b) Telecommunications utilities operating under Chapter 58 of the PURA, may under certain conditions file an application for a Commission review of the company's need for changes in the rates of its service as provided for under section 58.057. The timeline for implementation of the recommendations may need to be extended for these companies based on a finding that the investment limitations are applicable as provided for in section 58.053.

c) Telecommunications utilities operating under Chapter 59 may recover the cost of implementing the recommendations by requesting a rate adjustment under section 59.024(e). The timeline for implementing the recommendations may need to be extended for these companies if the investment limitations are applicable as provided for in section 59.029(a).

d) Telecommunications utilities operating under chapter 65 as a transitioning company or as a deregulated company are subject to service quality standards as are all other competitive telecommunications companies operating in the state (see, e.g. PURA 65.005). All certificated telecommunications utilities operating in the state should have the ability to meet the Commission's service quality requirements as provided for under section 54.103(b)(2) and 54.155(b)(2). The Commission does not set the rates for the deregulated carriers; they may recover those

costs from their customers, if they chose to do so pursuant to PURA 52.204.

e) Staff notes that an ILEC may seek Commission approval to recover the cost of implementing the recommendations if mandated by the Commission from the resellers and wholesale customers by providing the appropriate cost studies using TELRIC methodology if the interconnection agreements allow them to seek such recovery. Otherwise, they may seek recovery after the expiration of the contract terms set in the interconnection agreement by appropriately modifying the TELRIC studies in an arbitration proceeding.

VII. RECOMMENDATIONS:

Recommendations Applicable to Utilities Serving Coastal Areas

1. Staff recommends the initiation of a rulemaking to require telecommunications utilities to ensure that all central offices in hurricane prone areas are capable of full operation without interruption for at least 72 hours after loss of electric utility power.

2. Staff recommends the initiation of a rulemaking to require all permanent new and replacement transmission structures installed within 10 miles of the Texas coastline be designed to meet the current NESC wind loading standards assuming a maximum wind speed of 140 miles per hour. The rulemaking should also explore whether all permanent new and replacement transmission structures installed within 50 miles of the Texas coastline should be constructed to meet the current NESC wind loading standards. This requirement would not apply to temporary structures or to the replacement of damaged poles in a multi-pole structure.

3. Staff recommends that each electric utility that owns transmission facilities located within 50 miles of the Texas coastline be required to provide to the Commission information about each transmission line as follows:

a. On or before August 1, 2007, for all transmission lines, or portions thereof, located fewer than 10 miles from the Texas coastline, the following information:

i.) the length of the line;

ii.) a description of the types of structures used in the line; and

iii.) an estimate of the approximate cost and time required to upgrade the line to meet the current NESC standards for a wind velocity of 140 miles per hour.

b. On or before August 8, 2008, for all transmission lines, or portions thereof, located more than 10 and fewer than 50 miles from the Texas coastline, the following information:

i.) the length of the line;

ii.) a description of the types of structures used in the line; and

iii.) an estimate of the approximate cost and time required to upgrade the line to meet the current NESC standards

Recommendations Applicable Statewide

1. Staff recommends that each electric and telecommunications utility that has an on-going vegetation management program addressing all overhead facilities should file a written description of the program by October 1, 2006.

2. Staff recommends the initiation of a rulemaking to require each electric and telecommunications utility to have an on-going vegetation management program addressing all overhead facilities/lines. Each new

and existing vegetation management program should consider the growth rates of common vegetation in the service area and should incorporate defined vegetation management cycles/schedules appropriate for the vegetation.

Each new and existing electric and telecommunications utility vegetation management program should incorporate, as part of any scheduled or cyclic vegetation management activity, the trimming, or removal, of all trees located within its right of way (ROW) that currently compromise the National Electrical Safety Code (NESC) clearance limits or that will compromise these clearance limits prior to the next scheduled or cyclic activity.

3. Staff recommends that each electric and telecommunications utility that has an on-going cyclical, ground-based inspection program for its overhead facilities should file a written description of the program by October 1, 2006.

4. Staff recommends the initiation of a rulemaking to require each electric and telecommunications utility without an on-going cyclical, ground-based inspection program to develop and implement such a program for its overhead facilities. All new and existing programs should include a condition-based assessment of wood poles indicating their suitability for continued service. The rulemaking may require standards applicable to new and existing inspection programs.

5. Staff recommends the initiation of a rulemaking to require electric utilities to design and construct all new substations located within a 100-year floodplain so that the floor of the control house and all water-sensitive components of the substation operating equipment are above the elevation of the 100-year floodplain.

6. Staff recommends the initiation of rulemaking projects by the Commission to develop and adopt standards directing each electric and telecommunications utility to conduct inspections (during the utility's regular, ground-based inspection cycle) of its overhead facilities to determine whether the equipment located on those facilities, but not owned by the utility, is causing an overload on those structures. These rulemakings should also determine reasonable timeframes for each utility to correct any identified overloading problems and institute practices to prevent future overloads on these facilities.

   The rulemaking projects should require each electric and telecommunications utility to develop requirements, to be incorporated into existing "pole attachment" contracts and tariffs that ensure the structural integrity of the utility's overhead facilities in situations where other parties attach cables or other facilities.

7. Staff recommends that the Commission consider establishing incentives that encourage electric utilities to modernize their electric grids through the deployment of intelligent devices on the network. Several electric utilities have already undertaken limited projects, but incentives may be appropriate to encourage further development. These deployments enhance real-time monitoring of outages, selective switching of electric supply routes, and preventative maintenance of protective devices to increase the reliability of the power grid.

8. Staff recommends that, if new underground distribution facilities are to be installed in the rear of residential lots, electric utilities should work with developers and homeowners to establish buffer zones around the facilities in which no trees or structures will be placed ensure access to the facilities for any future repair work.

9. Staff recommends that to the extent it is not prohibited by city ordinances, electric utilities should encourage developers of new residential properties to utilize underground distribution facilities and should encourage location of these facilities in front of homes or in accessible alleyways.

ATTACHMENT 1
PUC Report of Electric Company Outages
10-08-05 11:00 AM

	Center Point	TXU	SWEPCO	TNMP	Mid- South	LCRA - City of	Bowie-Cass	Cherokee County	Upshur Rural	Rusk County	Sam Houston	Deep East	Jasper-Newton	Entergy	Total
				Electric	Synergy	Hemphill	Elec Coop	Elec Coop	Elec Coop	Elec Coop	Elec Coop	Electric	Elec Coop		Outages
County															
Anderson															0
Angelina		0									0		390		390
Austin	0														0
Bowie			0												0
Brazoria	0														0
Brazos					0										0
Burleson															0
Camp									0						0
Cass															0
Chambers														82	82
Cherokee															0
Fort Bend	0														0
Galveston	0													47	47
Gregg			0						0						0
Grimes					0										0
Hardin											1,689			4,657	6,346
Harris	0														0
Harrison			0						0						0
Henderson															0
Houston															0
Jasper												13	10,127		10,140
Jefferson														28,179	28,179
Liberty											47			65	112
Madison					0										0
Marion									0						0
Montgomery					0						0			13	13
Morris															0
Nacogdoches		0										0			0
Newton												338	4,799		5,137
Orange													828	16,850	17,678
Panola			0									0			0
Polk											0				0
Robertson															0
Rusk			0						0			0			0
Sabine												752	22		774
San Augustine												0			0
San Jacinto											0				0
Shelby												0			0
Smith									0						0
Titus															0
Trinity															0
Tyler											3,796			3,230	7,026
Upshur									0						0
Waller					0										0
Walker					0						0				0
Wharton	0														0

ATTACHMENT 1
PUC Report of Electric Company Outages
10-08-05 11:00 AM

Wood			0												0
	Center Point	TXU	SWEPCO	TNMP Electric	Mid- South Synergy	LCRA - City of Hemphill	Bowie-Cass Elec Coop	Cherokee County Elec Coop	Upshur Rural Elec Coop	Rusk County Elec Coop	Sam Houston Elec Coop	Deep East Electric	Jasper-Newton Elec Coop	Entergy	**Total Outages**
Not reported by county		0				0	0								0
															0
Total Curr	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**5,532**	**1,103**	**16,166**	**53,123**	**75,924**
Previous I	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**6,828**	**1,721**	**19,588**	**62,864**	**91,001**
Difference	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	(1,296)	(618)	(3,422)	(9,741)	(15,077)
Peak Outa	**715,000**	**216,900**	**74,035**	**19,038**	**25,165**	**600**	**34,477**	**610**	**21,044**	**1,400**	**64,466**	**20,000**	**20,900**	**286,609**	**1,500,244**
Cumulativ	(715,000)	(216,900)	(74,035)	(19,038)	(25,165)	(600)	(34,477)	(610)	(21,044)	(1,400)	(58,934)	(18,897)	(4,734)	(233,486)	(1,424,320)