

**STATEMENT OF DEANN T. WALKER
CHAIRMAN OF THE
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**BEFORE THE U.S. HOUSE OF REPRESENTATIVES
COMMITTEE ON ENERGY AND COMMERCE
SUBCOMMITTEE ON ENERGY**

**“THE 2017 HURRICANE SEASON: A REVIEW OF EMERGENCY RESPONSE
AND ENERGY INFRASTRUCTURE RECOVERY EFFORTS”**

NOVEMBER 2, 2017



Summary

Hurricane Harvey will be one of the most costly natural disasters in United States history. It made landfall near Rockport, Texas, at approximately 10:00 P.M. on August 25, 2017, as a Category 4 storm. It ultimately impacted the Texas coastline from Corpus Christi to the Louisiana border. There was significant damage in the Corpus Christi area due to the high wind speeds, while the Houston to Louisiana area mainly experienced severe flooding. The PUCT's initial assessment is that Texas utilities generally did an outstanding job responding to the storm. Power was restored to the vast majority of customers that could receive power by the second week after landfall of the storm, which was remarkable given the inability to access many areas until early September.

During an event, such as Hurricane Harvey, the State Operations Center (SOC) assembles a team of individuals from the affected electric utilities to work collaboratively with the PUCT as well as State and Federal officials on restoration of the electric system. At the SOC, the PUCT is the lead agency on issues related to electric outages and restoration, serving as the liaison with utilities, electric generators, key industrial facilities, other state agencies, and local officials, in order to provide situational awareness and facilitate restoration. During a storm, the PUCT as well as other State officials and agencies work closely with Federal agencies in order to facilitate restoration of electric service to an affected area. These agencies include the Department of Energy, the Army Corp of Engineers, the Federal Energy Management Agency, and the Department of Homeland Security.

Introduction

Chairman Upton, Ranking Member Rush, and members of the Subcommittee,

My name is DeAnn Walker, and I am the Chairman of the Public Utility Commission of Texas (PUCT). The PUCT is the regulatory body in Texas for electric, telecommunications, and water utilities, with the majority of work relating to the oversight of electric utilities that serve 27 million Texans, most of them through fully competitive wholesale and retail markets. I want to thank you for the opportunity to testify today and provide the perspective of the State of Texas on the electric sector's response to Hurricane Harvey.

Overview of Hurricane Harvey

As you are aware, Hurricane Harvey will end up as one of the most costly natural disasters in United States history. It made landfall near Rockport, Texas, at approximately 10:00 P.M. on August 25, 2017, as a Category 4 storm and was the strongest hurricane to hit the Texas coast since Hurricane Carla in 1961. Port Aransas and Rockport, which are directly northeast of Corpus Christi, experienced sustained winds in excess of 100 miles per hour with gusts that exceeded 135 miles per hour. Hurricane Harvey, unlike Hurricanes Ike and Rita, then stalled inland and slowly meandered around southeast Texas for the next three days, ultimately re-entering the Gulf, and making its final landfall just east of the Texas-Louisiana border on August 30, 2017.

The path of Harvey presented a number of unique issues related to the Texas electric sector. First, the short time period over which Harvey strengthened into a hurricane as well as the wide range of potential locations for its landfall limited the time for utilities to prepare and stage crews.

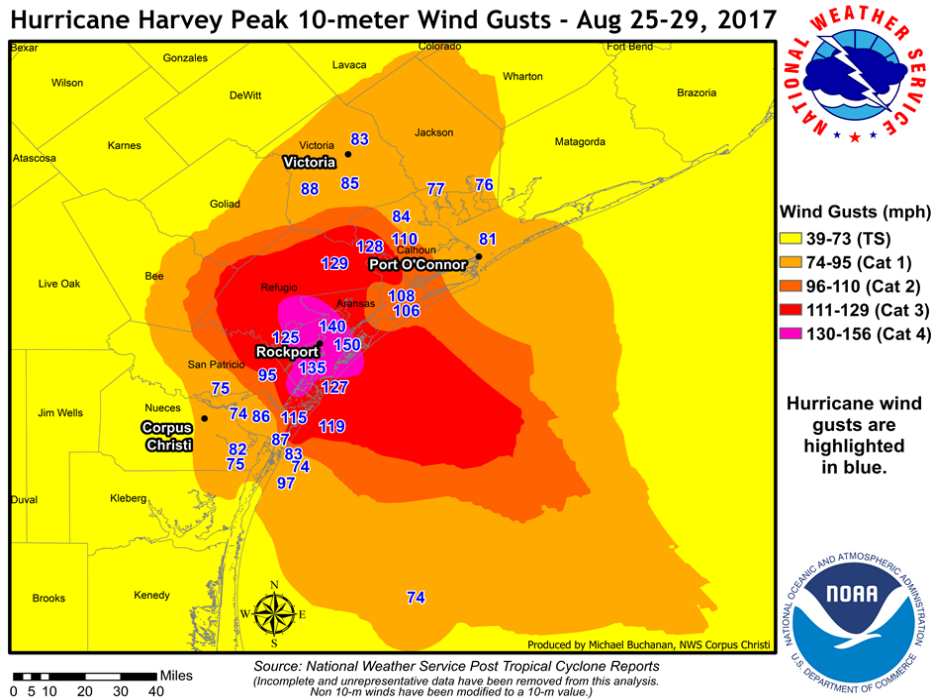
Figure 1 shows the wide divergence in forecast models two days before the storm hit with essentially the entire Texas coast being at risk.

Figure 1: August 23 Hurricane Harvey Forecast Track Map



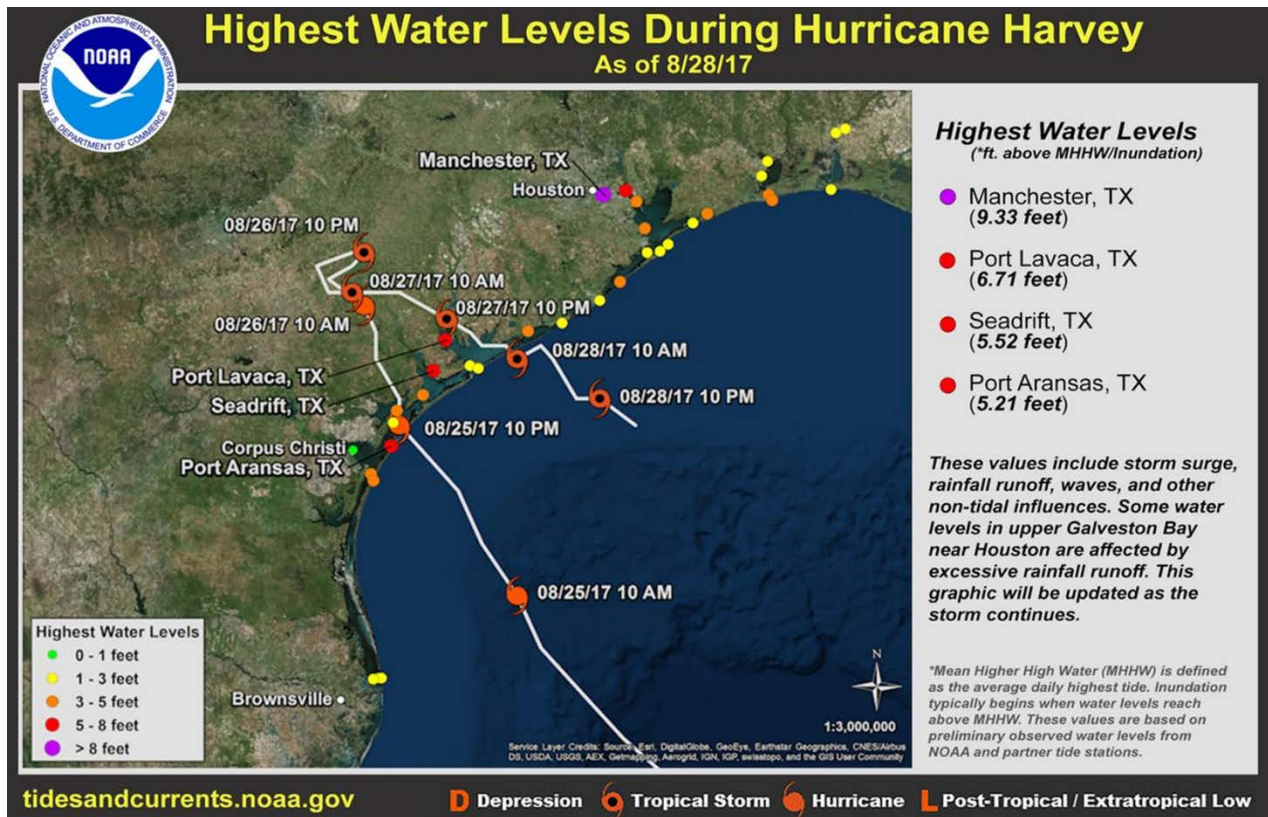
Second, the peak wind gusts of the storm as it made initial landfall reached 150 miles per hour in some areas (Figure 2). This created substantial wind storm damage to the electric infrastructure in the Rockport and Port Aransas areas. AEP Texas, the primary electric provider in this area, ultimately experienced impacts to 68 transmission substations, had 61 transmission lines that locked out during the storm, had 766 transmission structures downed or damaged, needed to repair or replace over 5,700 distribution poles, and replaced 712 miles – or nearly 4 million feet - of transmission and distribution conductor.

Figure 2: Hurricane Harvey Peak Wind Gusts



While that amount of damage to the infrastructure was substantial and a challenge to repair under typical storm aftermath, Harvey proceeded to persist as a Tropical Storm and stalled in the AEP Texas service area for a substantial amount of time – remaining inland as a named storm for 117 hours after initial landfall. The resulting persistent wind conditions and flooding created significant challenges for AEP Texas to fully assess the status of the system, as well as making ingress to impacted areas very difficult and dangerous. Figure 3 shows the meandering route taken by the storm through August 28th when Harvey re-entered the Gulf of Mexico.

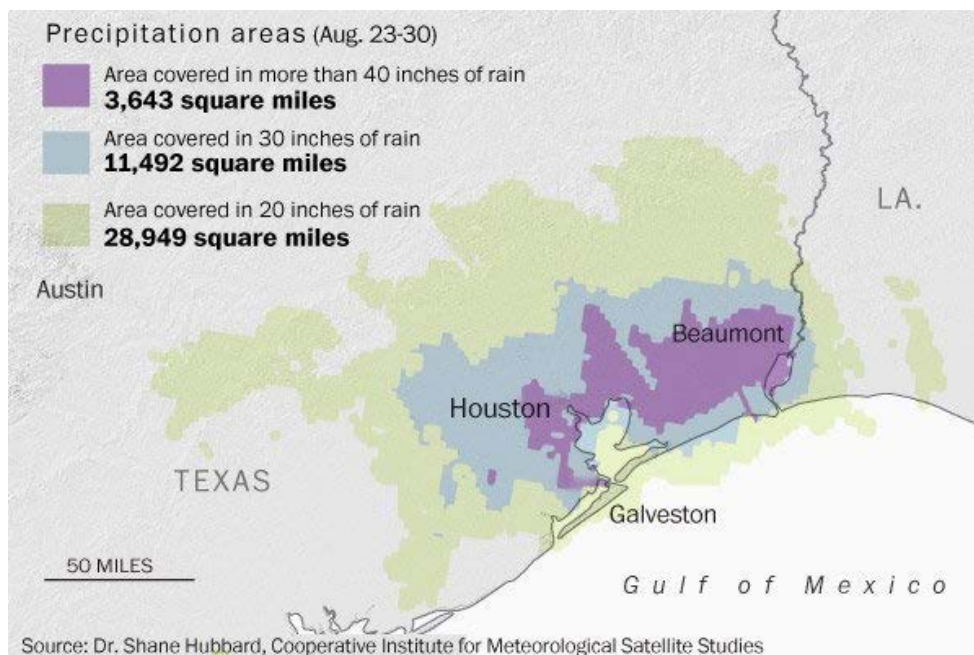
Figure 3: Harvey Storm Track through August 28th



As AEP Texas and other utility providers began the restoration process in the areas of Texas to the northeast of Corpus Christi, Harvey's rain bands continued across the Houston area, and later, the Beaumont and Port Arthur areas. As electric utility outages began to drop in the AEP Texas service area, outages began to increase in the CenterPoint Energy, Texas New-Mexico Power, and Entergy service areas, primarily due to flooding, wind damage from tornadoes, and lightning strikes. At least 37 tornadoes were declared to have occurred between Port O'Connor and Beaumont from August 25 through August 29, with hundreds of tornado warnings issued, and the Houston area experienced more than 42,000 lightning strikes.

There was also unprecedented torrential rain experienced by much of this area. Figure 4 shows the scale of historic flooding. To provide a sense of the scale of the flooding caused by the storm, approximately 27 trillion gallons of water rained down over six days. The area of Texas covered by more than 40 inches of rain is larger than the states of Delaware and Rhode Island combined. The area covered by 20 inches of rain is larger than ten states, including West Virginia.

Figure 4: Precipitation over Southeast Texas from August 23 to August 30



The scope and degree of this flooding presented obvious challenges to restoration of the electric system. First and foremost, many areas were simply inaccessible for as long as a week after the storm passed the area. Utilities had to reach equipment by boat or air boat, all-terrain vehicles, or amphibious and high water vehicles, and had to use helicopters and drones to reach areas to make damage assessments. Secondly, the extensive flooding impacted utility equipment – particularly substations – that had never before experienced flooding issues. For Entergy Texas, the loss of the City of Beaumont’s water supply required the relocation of Entergy’s command

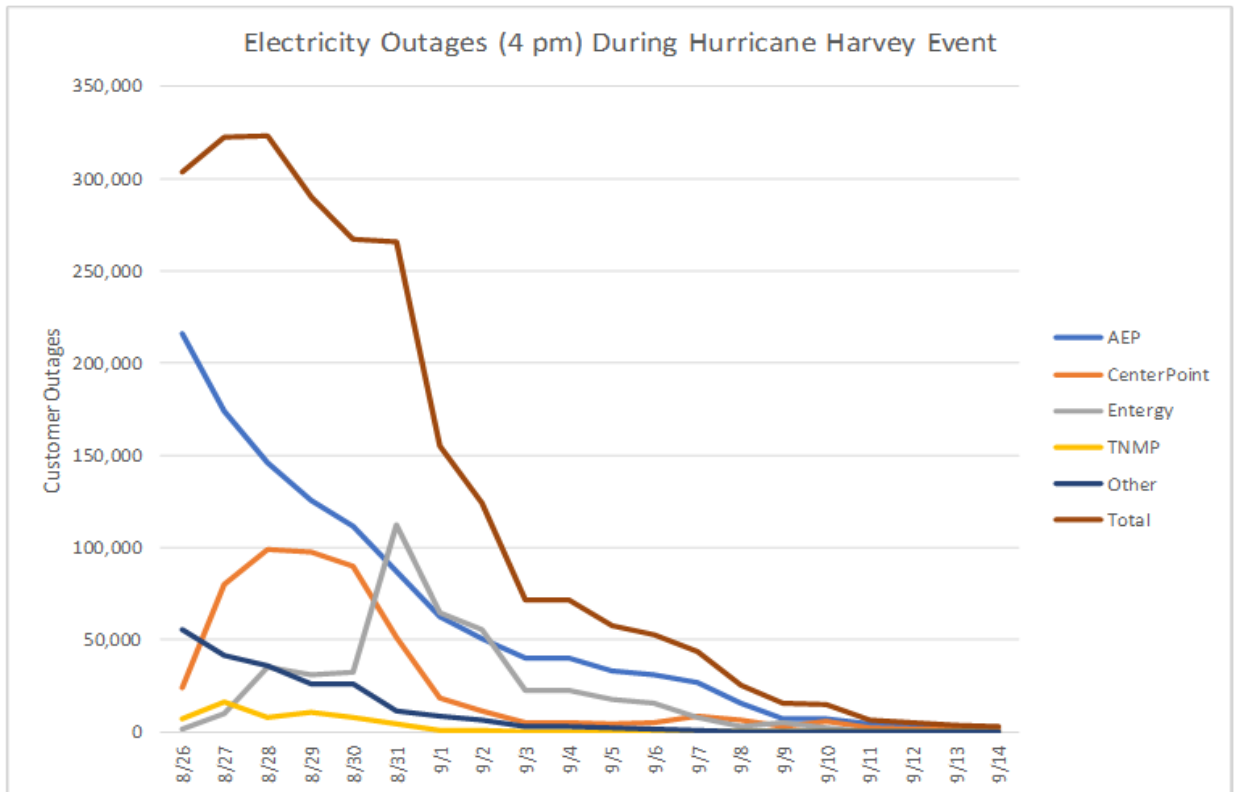
center to Conroe, which is approximately 100 miles away from Beaumont, and distribution operations center to Baton Rouge, which is approximately 190 miles away. In addition, Interstate 10 into Beaumont was closed on either side of the city.

Utility Response

Even with these unprecedented challenges, the PUCT's initial assessment is that Texas utilities generally did an outstanding job responding to the storm. Power was restored to the vast majority of customers that could receive power by the end of the first week in September, which was remarkable given the inability to access many areas until early September.

Figure 5 shows the PUCT's daily recording of electric outages at a 4:00 P.M. snapshot for every day of the event. The chart illustrates the path of the storm from initial landfall in the AEP Texas service area, followed by its movement toward Houston, which is the CenterPoint Energy service area, and ultimate final landfall in the Entergy service area, which includes Beaumont and Port Arthur. Total storm outages did not exceed 350,000 simultaneous customers, although the total number of customer restorations was much higher as utilities worked to restore outages as they occurred throughout the storm and aftermath. Areas with the most long-lasting outages were, as expected, those areas with wind-storm damage from the initial landfall as well as customers served from severely flooded substations.

Figure 5: Electricity Outages During Hurricane Harvey Event



The efforts of the Texas utilities to modernize the electric grid through advanced metering infrastructure and other intelligent grid technologies appears to have substantially aided in utility restoration. CenterPoint Energy alone operated 250 devices impacting 140,000 customers that helped to avoid over 41 million outage minutes for customers. AEP Texas, Texas-New Mexico Power, and CenterPoint Energy were able to utilize advanced metering systems to (1) remotely have knowledge of power outages without the need for customers to call in; (2) execute service orders remotely; and, (3) accurately bill customer accounts without the use of estimation routines that have resulted in significant issues in past storms.

As discussed above, utilities also utilized new technologies, such as drones, to assess damage, evaluate work conditions, and increase real-time situational awareness, and deployed mobile and temporary substations to route power around flooded and damaged substations.

The PUCT's Role in Emergency Response

Because of the broad and complex array of natural and other threats that face Texas and the importance of Texas' energy infrastructure to the nation, the PUCT, together with state leadership and other state agencies, considers emergency response planning and recovery as a key function of the agency, particularly given our unique role overseeing the Electric Reliability Council of Texas (ERCOT). The Texas State Operations Center (SOC) operates around the clock to monitor and analyze these threats to the State, and is activated when disasters pose an imminent threat to Texas. During an event, such as Hurricane Harvey, the SOC assembles a team of individuals from the affected electric utilities to work collaboratively with the PUCT as well as State and Federal officials on restoration of the electric system.

At the SOC, the PUCT is the lead agency on issues related to electric outages and restoration, serving as the liaison with utilities, electric generators, key industrial facilities, other state agencies, and local officials, in order to provide situational awareness and facilitate restoration. During Harvey, these activities included the following:

- working with the Texas Department of Transportation and the Texas Department of Public Safety to facilitate utility crew movement and escorts for large utility equipment, such as mobile substations;
- coordinating with ERCOT, utilities, and refineries to facilitate rapid restart of refineries – particularly in the Corpus Christi area;

- coordinating with ERCOT and the Railroad Commission of Texas regarding natural gas supply prioritization to electric generators; and,
- working with the Office of the Governor on rule and statute suspension, where needed, to facilitate restoration.

During a storm, the PUCT as well as other State officials and agencies work closely with Federal agencies in order to facilitate restoration of electric service to an affected area. These agencies include the Department of Energy, the Army Corp of Engineers, the Federal Energy Management Agency (FEMA), and the Department of Homeland Security. Issues that are addressed include the following:

- reporting of outages and estimated restoration times;
- potential need for emergency power provisions between Entergy and the ERCOT system;
- prioritizing restoration of critical infrastructure;
- siting and interconnecting back-up generators for critical customers;
- facilitating the utility connections for FEMA mobile housing units; and,
- addressing the process for inspections of facilities for reconnection after repairs have been completed and electric service needs to be restored.

PUCT's After Action Items

While the preliminary assessment is that the State's emergency management planning and system, as well as the preparations and restoration efforts by the utilities during and after the storm event, proved to be effective, there is room to improve for the next storm. As such, the PUCT will

conduct an after-action review of a number of items, including reviews of the inventory of spare utility equipment among Texas utilities, communication methods by utilities to the public and state officials on outage status, evaluation of the utilities' mutual assistance programs and equipment sharing, and issues unique to market processes in the ERCOT competitive retail electricity market.

Conclusion

I want to thank the Subcommittee for the opportunity to provide a Texas perspective on these issues. Ensuring the reliability and recovery of our nation's power grid after major weather events is an exceptionally important and complex undertaking, and I applaud your focus on this subject. I stand ready to work with you to continue active and productive coordination between the Federal and State agencies in future events.