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APPLICATION OF CENTERPOINT ENERGY HOUSTON ELECTRIC, LLC FOR APPROVAL TO AMEND ITS DISTRIBUTION COST RECOVERY FACTOR	**§**	**BEFORE THE STATE OFFICE OF ADMINISTRATIVE HEARINGS**

DIRECT TESTIMONY

OF

KEVIN J. MARA

ON BEHALF OF

HOUSTON COALITION OF CITIES

SEPTEMBER 16, 2022

DIRECT TESTIMONY OF KEVIN J. MARA
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EXHIBITS

I. INTRODUCTION

Q. Please state your name, occupation and business address.

A. My name is Kevin J. Mara. My business address is 1850 Parkway Place, Suite 800, Marietta, Georgia 30067. I am the Executive Vice President of the firm GDS Associates, Inc. ("GDS") and Principal Engineer for a GDS company doing business as Hi-Line Engineering. I am a registered engineer in Texas and in twenty-two (22) additional states.

Q. On whose behalf are you appearing and in what capacity?

A. I have been retained by the Houston Coalition of Cities ("HCC") as an expert witness in this proceeding.

Q. What are your principal areas of responsibility in this capacity?

A. I was asked to review CenterPoint Energy Houston Electric, LLC's ("CEHE") mobile generator program for compliance with Section 39.918 of the Texas Public Utility Regulatory Act ("PURA") and to determine the reasonableness of the program. As part of my assignment, I was asked to review the capacity levels of the mobile generations, the cost of the leases, and the competitive nature of the bidding process as required by Section 39.918(f).

Q. Please state your educational background and professional experience.

A. I received a Bachelor of Science degree in Electrical Engineering from Georgia Institute of Technology in 1982. Between 1983 and 1988, I worked at Savannah Electric and Power as a distribution engineer designing new services to residential,

commercial, and industrial customers. From 1989-1998, I was employed by Southern Engineering Company as a planning engineer providing planning, design, and consulting services for electric cooperatives and publicly owned electric utilities. In 1998, I, along with a partner, formed a new firm, Hi-Line Associates, which specialized in the design and planning of electric distribution systems. In 2000, Hi-Line Associates became a wholly owned subsidiary of GDS Associates, Inc. and the name of the firm was changed to Hi-Line Engineering, LLC. In 2001, we merged our operations with GDS Associates, Inc., and Hi-Line Engineering became a department within GDS. I serve as the Principal Engineer for Hi-Line Engineering and am Executive Vice President of GDS Associates.

I have a strong background in system reliability and resiliency. This includes storm hardening, expertise in the National Electric Safety Code, and alternate power sources such as solar, battery, and reciprocating distributed generation. I have developed interconnection requirements for various forms of generation, and have designed the interconnection of solar, battery, wind, and reciprocating distributed generation. I have provided consulting services regarding standby generation, hydro-electric generation, and solar/battery generation to delay capital investments.

I have field experience in the operation, maintenance, and design of transmission and distribution systems. I have performed numerous planning studies for electric cooperatives and municipal systems. I have prepared short circuit models and overcurrent protection schemes for numerous electric utilities. I have also provided general consulting related to system operations, and power system design.

Q. Please describe GDS Associates, Inc.

A. GDS is an engineering and consulting firm with offices in Marietta, Georgia; Austin, Texas; Auburn, Alabama; Orlando, Florida; Manchester, New Hampshire; Kirkland, Washington; Portland, Oregon; and Madison, Wisconsin. GDS has over 170 employees with backgrounds in engineering, accounting, management, economics, finance, and statistics. GDS provides rate and regulatory consulting services in the electric, natural gas, water, and telephone utility industries. GDS also provides a variety of other services in the electric utility industry including power supply planning, generation support services, financial analysis, load forecasting, and statistical services. Our clients are primarily publicly owned utilities, municipalities, customers of privately owned utilities, groups or associations of customers, and government agencies.

Q. Have you testified before any regulatory commissions?

A. I have submitted testimony before the following regulatory bodies:

- Corporation Commission of Oklahoma
- District of Columbia Public Service Commission
- Federal Energy Regulatory Commission ("FERC")
- Florida Public Service Commission
- Maryland Public Service Commission
- Public Utility Commission of Texas
- Vermont Department of Public Service

I have also submitted expert opinion reports before United States District Courts in California, South Carolina, and Alabama.

Q. Have you prepared an exhibit describing your qualifications and experience?

A. Yes. I have attached Exhibit KJM-1, which is a summary of my regulatory experience and qualifications.

II. SCOPE OF TESTIMONY AND SUMMARY OF RECOMMENDATIONS

Q. What is the purpose of your testimony in this proceeding?

A. The purpose of my testimony is to present an evaluation of CEHE's program for mobile generators, specifically whether it complies with PURA § 39.918, and to provide recommendations regarding the prudence, reasonableness, and cost effectiveness of the program.

Q. Please summarize your opinions and recommendations.

A. My opinions and recommendations are summarized as follows:

1. A reasonable and prudent amount of temporary generation for storm restoration and load shed events for CEHE is between 200 MW to 250 MW.
2. The short-term lease contract bid process in August 2021 does not meet the requirements of PURA § 39.98(f) because it was not competitively bid.
3. I recommend that only $4,050,000 out of the $19,882,307 sought by CEHE related to the short-term lease payments which represents the low cost bid. This recommendation reduces the lease payments by $15,832,307.
4. The extension of the short-term lease with a potential term of nine (9) months starting December 31, 2021, has a value of $80,280,000. The extension of the short-term lease was not competitively bid as required by PURA § 39.918(f).

Therefore, the prepayment of the short-term lease amendment for costs in 2022, which is $3,830,395, should be excluded from the costs to be used to determine a cost recovery.

5. The long-term contract for 500 MW of capacity exceeds a reasonable and prudent level of capacity.. Therefore, the prepayment of this long-term lease of $175,466,076 should be excluded from the 2021 costs to be used to determine a cost recovery.

6. There is no significant adverse impact from my disallowance of the prepayment of the long term lease because there is an "exit ramp" that protects CEHE in the event a Commission ruling creates an adverse event.

7. My opinions and recommendations are summarized and compared in Table KJM-1.

Table KJM-1

Mara's Recommendation for Total Rate Base Mobile Generation					
Category	Lease Payments	Operational Costs	Return	Total Deferral	CEHE's Proposed Total Deferral (1)
Short-term Prepaid Lease	$4,050,000	$278,353	$37,206	$4,365,559	$20,269,958
Short-term Prepaid O&M	$0	$0	$0	$0	$3,830,395
Long-term Prepaid O&M	$0	$0	$0	$0	$24,897,566
Long-term Prepaid Lease	$0	$0	$0	$0	$150,568,510
Total	$4,050,000	$278,353	$37,206	$4,365,559	$199,566,430

(1) Source: Garmon Amended Direct Testimony, Table MAK-2

III. OVERVIEW OF PURA § 39.918

Q. Can you describe your understanding of PURA § 39.918?

A. PURA § 39.918, UTILITY FACILITIES FOR POWER RESTORATION AFTER WIDESPREAD POWER OUTAGE, allows a transmission and distribution utility

to lease and operate facilities that provide temporary emergency electric energy to aid in restoring power to the utility's distribution customers during a widespread power outage. Under this section, a widespread power outage can be declared when the independent system operator has ordered the utility to shed load or when the utility's distribution facilities are not fully served by the bulk power system under normal operations (PURA § 39.918(b)(1)). A widespread outage is one that will result in loss of electric power that has lasted or is expected to last more than 8 hours (PURA § 39.918(a)).

Another key criterion is that the temporary emergency electric energy source (e.g., mobile generators) must operate isolated from the bulk power system and the transmission/distribution utility is prohibited from selling energy (PURA § 39.918(c)).

In addition, the utility shall use a competitive bidding process to lease the temporary emergency electric energy source (PURA § 39.918(f)).

The Commission may only authorize a utility to recover the reasonable and necessary costs of leasing and operating the facilities if the temporary emergency electric energy source meets PURA's criteria (PURA § 39.918(g)).

Q. What is your understanding of the temporary emergency electric energy resources as proposed by CEHE in this docket?

A. I understand that the purpose of the temporary emergency electric energy resources, which in this case take the form of mobile generators, are to be used for load shed events and for restoration from widespread outages from hurricanes and storms.[1] In

[1] *See* Amended Direct Testimony of Martin W. Narendorf, Jr., p. 7, lines 18-22.

accordance with PURA § 39.918, CEHE may request recovery of reasonable and necessary costs of leasing and operating facilities. The approved costs can then be requested in a distribution cost recovery factor, base rate case, or other proceeding approved by the Commission

Q. How much generation has CEHE leased that is subject to this case?

A. CEHE entered into a short-term lease for 125 MW starting in early September 2021.[2] On December 31, 2021, the short-term lease was amended to increase the total leased generation to 220 MW. In addition, CEHE entered into a long-term lease for 125 MW of generation on December 31, 2021. CEHE opted for a pre-payment plan resulting in costs in 2021 which could be subject to cost recovery. The costs for these contracts, which are booked as O&M costs, were presented by Mr. Garmon in Table MAK-2 Mobile Generation Regulatory Assets and Prepayments.[3] This data is shown in Table KJM-1 and shows a total of $199,566,430 as of December 31, 2021, which includes $179,296,472 in prepaid amounts for contracts signed on December 31, 2021.

IV. Reasonableness of the Capacity of Mobile Generators

Q. What is your understanding of the total capacity in mobile generators that CEHE intends to lease?

A. My understanding is that CEHE wishes to have 500 MW of capacity in 2022. Mr. Martin Narendorf, stated that the long-term lease is aimed at procuring multiple mobile generation facilities with a gross nameplate capacity of approximately 500

[2] *See* Amended Testimony of Jeff W. Garmon, p. 32, lines 24-26.
[3] *See* Amended Testimony of Jeff W. Garmon, p. 36.

MW to be available to use year-round during widespread outages. Specifically, CEHE plans to use these mobile generation facilities to aid in storm restorations and to enhance load rotation during load shed events.[4]

Q. In your opinion, is this total capacity of 500 MW reasonable and necessary?

A. No. The amount of capacity must be reasonable and prudent. CEHE used the two use scenarios to justify the mobile generation capacity. These scenarios include major storms/hurricanes and load shed events. In my opinion, a 500 MW capacity level is not reasonable nor prudent.

Q. What is a reasonable and prudent level of capacity for CEHE?

A. As detailed in this testimony, between 200 MW and 250 MW would be a prudent and reasonable level for CEHE.

MAJOR STORMS/HURRICANES

Q. Please address the scenario of major storms/hurricanes.

A. In the last five years, there have been two major storms that affected CEHE's system: Hurricane Nicholas (2021) and Hurricane Harvey (2017). Hurricane Nicholas caused widespread outages but did not result in substations being without bulk electric service for periods longer than 8 hours.[5] Thus the mobile generators could not be deployed for this event as limited by PURA § 39.918.

Hurricane Harvey caused only 10 substations to lose bulk power service for more than 8 hours.[6] These substation events are summarized in Table KJM-2.

[4] *See* Amended Direct Testimony of Martin W. Narendorf, Jr., p. 12, lines 11-13.
[5] *See* CEHE Response to HCC 8-8(b).
[6] *Id.*

Table KJM-2
Hurricane Harvey
Substations that could not receive power from transmission grid for more than 8 hou

Substation	Address	Outage Start	Outage End	Duration
Addicks	Houston TX	8/30/17 1:03	8/30/17 17:49	~16 hours
Britmoore	Houston TX	8/29/17 20:07	8/30/17 18:07	~22 hours
Parkway	Houston TX	8/28/17 18:06	8/31/17 23:00	~3 days
North Belt	Houston TX	8/27/17 21:18	8/30/17 23:59	~3 days
Wallisville	Houston TX	8/27/17 1:07	8/30/17 17:00	~3 days
Brazos Valley	Richmond TX	8/29/17 3:00	9/3/17 19:00	~5 days
Pledger	Pledger TX	8/29/17 13:33	9/4/17 18:00	~6 days
Memorial	Houston TX	8/28/17 18:03	9/5/17 0:00	~8 days
Brays	Houston TX	8/27/17 11:09	9/4/17 12:00	~8 days
West Columbia	Columbia, TX	8/26/17 18:30	9/13/17 17:24	~18 days *
	* all power restored to customers in 10 days			

None of the substations listed in Table KJM-2 were selected by CEHE as a pre-staged location for a mobile generator. It is possible that some mobile generators could be relocated to these affected substations to speed up restoration times for customers served by these substations. However, these generators are substantial pieces of equipment requiring significant time and logistics to de-mobilize at one location, transport, re-configure, commission, and tie to an isolated grid.

Q. What is your understanding of the time required to re-deploy a 5 MW mobile generator?

A. The 5 MW generators can obtain transportation permits in the same day. The smaller 5 MW generators, while still very sizable, can be deployed and operational in a timely manner. Since a transportation permit for the 5 MW unit can be obtained the same day, a 5 MW generator can be re-deployed in roughly 12 hours when including travel time.[7]

[7] See CEHE Response to HCC 8-6.

CEHE's long term lease includes a provision that the mobile generators be deployed and operational in forty-eight (48) hours.[8] The long-term lease will have eleven (11) 5.7 MW generators and fourteen (14) 32 MW generators. This contractual requirement for deploying generators is not included in the short-term lease in place for 2021. Also, the forty-eight (48) hours for deployment does not include time to obtain transportation permits for the oversize loads of these mobile generators.

Based on the contractual requirements in the long-term lease and the practicable re-deployment time, it is reasonable to assume that twelve (12) to forty-eight (48) hours is the expected re-deployment time.

Q. What is your understanding of the time required to re-deploy a 32 MW generator?

A. I understand that the time to re-deploy is seven (7) to eight (8) days, which means these generators have little to no value for recovery from hurricanes. The 32 MW units are sizable[9] and require super load permits that typically require five (5) business days to process.[10] In addition, CEHE states that to relocate a 32 MW unit will require five (5) days, not including the time for obtaining the permit. Thus, assuming some overlap of de-commissioning and permitting time, the 32 MW units will realistically require seven (7) to eight (8) days to re-deploy to a new site.

[8] *See* CEHE Response to HCC 8-6(a).
[9] *See* Amended Direct Testimony of Martin W. Narendorf, Jr., Exhibit MWN-3 for photos of the 5 MW and 32MW generators.
[10] *See* CEHE Response to HCC 8-6(e).

Q. In your opinion, can a 32 MW generator fit in any substation site?

A. No. Significant space is required for the 32 MW units along with a readily available fuel supply to feed this large generator, which means these units cannot be placed at all substation sites.

Q. Since the 32 MW generators will need seven (7) to eight (8) days to re-deploy, in your opinion are the 32 MW generators reasonable to be used hurricane restoration?

A. No. The 32 MW units are not readily mobile and not reasonably effective in speeding up restoration for major storms/hurricanes. As shown in Table KJM-2, following Hurricane Harvey, only one substation had outages that extended beyond eight (8) days. Even if the permit for a super load could be expedited, there were few substations with outage times exceeding five (5) days. Thus the lengthy time needed to deploy the 32 MW units makes them impractical for supporting restoration for major storms/hurricanes.

Q. Did CEHE use a mobile generator during Hurricane Nicholas?

A. Yes. Mr. Narendorf stated CEHE deployed a mobile generator at the civic center in Lake Jackson[11] and provided emergency power for four (4) days.[12]

Q. Did the use of this mobile generator during Hurricane Nicholas meet the requirements of PURA § 39.918?

A. No.

[11] *See* Amended Direct Testimony of Martin W. Narendorf, Jr., p. 21, lines 2-9.
[12] *See* CEHE's Response to TCPA 1-1, Attachment p. 5 of 10.

Q. Please explain why the use of this mobile generator did not meet the requirements of PURA § 39.918.

A. The use of the mobile generators did not meet the requirements of PURA § 39.918 because the bulk transmission system was not damaged in this area. The reason the area surrounding the Lake Jackson Civic Center was out of power is because of damage to the localized distribution system.[13] Thus, this is a good example of how *not* to use a mobile generator during major storms within the bounds of PURA § 39.918.

Q. In your opinion, is the use of mobile generation reasonable and prudent for storm restoration when bulk power is unavailable?

A. Yes. The smaller 5.7 MW units which are truly mobile can be reasonable and prudent if the number and capacity matches the likely impacts to the system. In the last thirty-eighty (38) years, CEHE's service area has been impacted by seven (7) hurricanes[14] which is a return period of five (5) to six (6) years as shown in Table KJM-3. The leased generators could reasonably be expected to be used for emergency restoration caused a hurricane once every five (5) or six (6) years. Over the last four (4) hurricanes, the time to restore all power averages 8.5 days as compared to the previous hurricanes (Alicia, Andrew, and Katrina) which required on average 30.6 days to restore power. Thus, the need for emergency temporary generators has decreased over the years. This improvement is due, in part, to the

[13] *See* CEHE's Response to HCC and PUC's Technical Conference Questions, p. 5 of 20.
[14] *See* CEHE's Response to TCPA 1-1, Attachment p. 9 of10.

storm hardening measures employed by CEHE, which I understand exceed $150 million dollars for the combined years 2017 to 2021.[15]

Table KJM-3
Hurricane Impacts on CEHE's System
Source: CEHE Response to TCPA 1st RFI

Year	Name	Cat.	Winds Sustained (mph)	Tropical Storm Wind Field (Miles)	Electric Outages	Restoration
1983	Alicia	3	115	125	750,000	16 days
1992	Andrew	4	160	105	1.4 million	34 days
2005	Katrina	3	125	230	970,000	42 days
2005	Rita	3	115	205	719,000	6 days
2008	Ike	2	110	450	2.15 million	18 days
2017	Harvey	4	130	270	1.27 million	10 days
2021	Nicholas	1	75	120	705,000	5 days

As I opined, the 32 MW mobile generation units leased by CEHE require too much time to deploy, permit, transport, and commission to be effective for storm restoration. In 2021, CEHE had five (5) 5.7 MW generators leased which is a reasonable number of units and these units are reasonably portable to aide in restoration following a major storm event. Thus, in my opinion, these five (5) 5.7 MW units are prudent and reasonable assets.

LOAD SHED EVENTS

Q. Can you address the scenario of load shed events?

A. Yes. CEHE's system is within Electric Reliability Council of Texas, Inc. ("ERCOT") territory. ERCOT is responsible for ensuring that the supply of electricity is sufficient to meet customer demand (load). During a power emergency when electric supply cannot meet customer demand for electricity, the demand must

[15] Based on a review of Docket No. 39339, CenterPoint's annual budgets to harden transmission and substation facilities.

be reduced to avoid uncontrolled blackouts. As a last resort, ERCOT will instruct electric utilities to implement controlled customer outages to reduce electricity demand. This is referred to as a load shed event. The goal, of course, is to design the generation system to meet or exceed demands such that load shed events are not necessary.

Over the last thirty-two (32) years, there have been four (4) load shed events in Texas which are shown in Table KJM-4.

Table KJM-4
Load Shed Events Since 1989
Source: CEHE Response HCC 8th RFI Q2

Date	ERCOT Total Shed	CEHE Shed Share	Duration
December 21-24, 1989	500 MW	132 MW	~30 minutes
April 17, 2006	1,000 MW	250 MW	~2 hours
February 2-6, 2011	4,000 MW	1,000 MW	~7.5 hours
February 15-19, 2021	20,000 MW	5,000 MW	~55 hours

According to PURA § 39.918(a)(1)(B), the use of the temporary generation electric energy is limited to events that exceed eight (8) hours. For the load shed events from the last thirty-two (32) years, the temporary generation electric energy could be deployed only once.

Q. When there is a load shed event, how can a Transmission and Distribution Utility ("TDU") respond to the reduction in demand?

A. During a load shed event, TDUs have a number of methods to employ to reduce electric demand on their systems. These include demand response programs, interruptible commercial/industrial customers, and use of behind-the-meter distributed generation.

Q. What resources does CEHE have available to reduce their demand?

A. CEHE only has load shed options which include under-frequency load shed circuits ("UFLS") and intelligent grid switching devices ("IGSD").[16] Both of these options are essentially load shed options, meaning that customers will be without power for some time duration during a load shed event.

Q. In your opinion should CEHE be able to offset all of the 5,000 MW, it was called upon to load shed in Winter Storm Uri?

A. No. It is not reasonable to assume that CEHE will need sufficient capacity to offset all demand lost during a load shed event. This is especially true considering the rare occurrence of the load shed events.

Q. Can you describe what TDUs in Texas are doing regarding assets needed to offset load shed events?

A. Yes. As of April 14, 2022, Oncor is leasing fifteen (15) mobile generation units with a total capacity equivalent to approximately 11 MW for use as an electrical backup in the event of a widespread outage, meeting the criteria of PURA § 39.918(a). The primary uses for these mobile generation units include, but are not limited to, the following: government agencies, fire departments, police departments, 911 call centers, hospitals, emergency shelters / warming facilities, and water treatment facilities.[17]

I am not aware of activities related to PURA § 39.918 by other TDUs in Texas.

[16] *See* CEHE Response to HCC 8-9(b).
[17] *See* Docket No. 53601, Application of Oncor Electric Delivery Company LLC for Authority to Change Rates, Direct Testimony of Keith Hull, p. 26, lines 26-29.

Q. Can you describe what other utilities in Texas are doing regarding assets needed to offset load shed events?

A. It is my understanding that Entergy Texas, Inc ("ETI") plans to address a portion of its long-term resource requirements and enhance the resiliency of its electric system with the installation of a fleet of Company-owned natural gas-fired distributed generation ("DG"). These DG resources will act as "microgrids" installed throughout ETI's distribution system and serve the dual functions of 1) meeting a portion of the capacity and energy needs of ETI's broader customer base and 2) the backup power needs of host commercial and industrial customers during an outage. Because these microgrids will be used to provide power to host customers during a grid outage, ETI is calling this fleet of DG the Power Through fleet.[18] The expressed interest by customers in backup electric service supplied by a Power Through generator is 120 MW.[19]

From my research, Austin Energy and CPS Energy have no plans for backup generators related to mitigating load shed events.

Q. Mr. Narendorf's direct testimony states CEHE contacted Pacific Gas and Electric Company ("PG&E") regarding PG&E's use of mobile generators to mitigate outages from planned public safety shutoffs in areas with potential for wildfires. Please describe PG&E's program for mobile generators.

A. In California, because high winds may cause trees and debris to contact energized lines and start a wildfire, electric utilities may need to turn off power as a last resort

[18] *See* Docket No. 53992, Entergy Texas, Inc's Statement of Intent for Rate Schedule UODG, Direct Testimony of Chris Gilliland, p. 4, lines 9-12.
[19] *See* Docket No. 53992, Entergy Texas, Inc's Statement of Intent for Rate Schedule UODG, Direct Testimony of Chris Gilliland, p. 10, lines 17-18.

during dry, windy weather. This is known as a Public Safety Power Shutoff ("PSPS").[20] PG&E's goal is to restore power within twenty-four (24) hours after high winds have passed.[21] In 2020, PG&E reserved 350 MW of temporary generation and in 2021 PG&E reserved 168 MW of temporary generation[22] to help mitigate outages during a PSPS.

Q. How does PG&E compare to CEHE in terms of size and generator capacity?

A. Mr. Narendorf stated CEHE reached out to PG&E for ideas for a backup generator program. PG&E has nearly twice as many customers as CEHE and the PSPS events occur multiple times each year whereas CEHE's load shed events have only occurred once in thirty-two (32) years when the temporary generators can be used in accordance with PURA § 39.918.

Q. How do other utilities in Texas compare to CEHE in terms of size and generator capacity?

A. I prepared Table KJM-5 which compares the utilities I mentioned in Texas as well as PG&E. It is obvious that CEHE is an outside the norm.

[20] PG&E Your Guide to Public Safety Power Shutoffs July 2022, page 2
[21] PG&E Your Guide to Public Safety Power Shutoffs July 2022, page 8
[22] See CEHE Response to TCPA 1-4, Attachment.

Table KJM-5
Comparison of Backup Generation Capacity

Utility	Approximate Number of Customers	Backup Generation
Entergy Texas	486,000	120 MW
Austin Energy	500,000	0 MW
CPS Energy	804,000	0 MW
Centerpoint	2,400,000	500 MW
Pacific Gas & Electric	5,500,000	168 MW
Oncor	13,000,000	11 MW

Q. In your opinion has CEHE justified 500 MW for backup capacity for hurricanes and/or load shed events?

A. No. CEHE has failed to demonstrate that this magnitude of 500 MW of backup generation capacity is a prudent and reasonable course of action. As I stated earlier 25 MW (five (5) 5 MW mobile units) would be reasonable for aiding in restoration from hurricanes. Other utilities in Texas range from a potential of 11 MW to 120 MW for investor-owned utilities and no temporary generation for larger municipal utilities. PG&E, from whom CEHE modeled their mobile generator program, is twice the size of CEHE in terms of customers served and is utilizing between 168 MW and 350 MW of temporary generation. Based on these data points, and the lack of frequency of load shed events over the last thirty-two (32) years in Texas, a reasonable mobile generation capacity is less than 500 MW.

ROTATION OF LOAD DURING LOAD SHED EVENTS

Q. Can you explain the rotation of load during a load shed event?

A. Yes. When utilities are instructed to provide load shedding, the generally preferred method is an automatic scheme that rotates the outage from one group of customers to another. Typically, customers are grouped together by feeder or substation and

their power is turned off. After a preset time, a different group will be turned off and the first group will be turned back on. This rotation of the load shed is designed to minimize the burden on any one group of customers. This is often referred to as a rolling blackout.

Q. It is your understanding that there is a threshold at which CEHE can no longer utilize automatic load rotation during a load shed event?

A. Yes. The CEHE threshold limit is 50% of the load that is available in the feeders' load shed block. This results in roughly half the customers off and the other half on. For Winter Storm Uri, there were approximately 3,375 MW of available load shed which means CEHE limits are about 1,688 MW.[23]

Q. Once this rotational load threshold is exceeded what occurs to the system?

A. Two possible scenarios could occur. One scenario is that the electric utility (such as CEHE) can abandon rotational load shed and manually turn off groups of customers without the benefit of planned rotation. The other scenario is that the feeder breakers have relays that automatically trip power to customers when the system voltage frequency sags below a preset level. This is a measure of last resort in that as a power grid starts to overload (more demand than supply), the voltage frequency will sag below 60 hertz. The underfrequency relays will trip at a preset limit thus sacrificing load to avoid a cascading failure of the grid.

[23] *See* CEHE Response to TEAM RFP 01-03

Q. Did you consider the impact of a lessor amount of generation such as 125 MW of mobile generation as it relates to the load shed event during Winter Storm Uri?

A. Yes. I considered Winter Storm Uri in my analysis. About four (4) hours into the load shed event, ERCOT's call for load shed exceeded CEHE's theshhold to use rotating load shed. If CEHE had 500 MW of temporary generator capacity available, as shown in my Exhibit KJM-2, I determined the rotating load shed would have been overwhelmed 6.5 hours into the event.[24] Using an assumed level of 125 MW as compared to 500 MW does not significantly change the impact of the load shed event.

Q. You stated that five (5) 5.7 MW generators are reasonable to assist in hurricane restoration efforts. Can these 5.7 MW units be used for load shed events?

A. Yes. The 5.7 MW units can be used for both load shed events and hurricane restoration. Because of the low frequency of both hurricane events and load shed events, the size generator should be nimble enough to be utilized for both events.

[24] *See* CEHE Response to TEAM RFP 01-04

V. SHORT TERM LEASE

Q. Is it your understanding that CEHE conducted two (2) different procurements for mobile generators?

A. Yes. CEHE issued a request for proposals for short term leases of approximately 140 MW of generators on August 3, 2021.[25] CEHE later issued a request for proposals for long term leases of approximately 500 MW on October 4, 2021.[26]

Q. Can you describe the schedule for responses and delivery contained in the short-term lease request for proposals?

A. Yes. [Begin Confidential] [redacted] [End Confidential]

Q. What is your opinion of the schedule provided to the potential bidders?

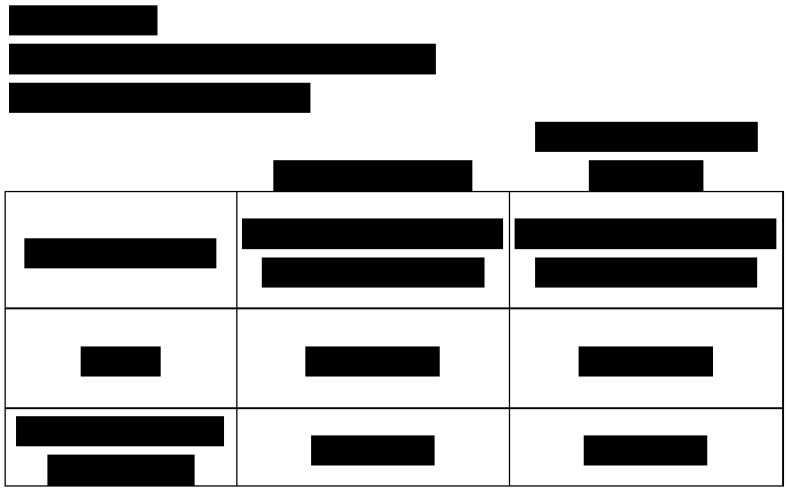
A. The schedule provided was not realistic and greatly reduced the number of competitive responses. The Request for Proposal ("RFP") was issued on a Friday with responses due on the following Monday for lease agreements for two (2) months ranging from [Begin Confidential] [redacted] [End Confidential].[28] The time frame is not reasonable for vendors to obtain the necessary approvals for the bid levels anticipated by the RFP. Further, requiring delivery of the units seven (7) days after notice of award is not reasonable. CEHE needs to

[25] *See* Amended Direct Testimony of Martin W. Narendorf, Jr., p. 13, lines 9-12.
[26] *See* Amended Direct Testimony of Martin W. Narendorf, Jr., p. 14, lines 14-16.
[27] *See* CEHE Response to HCC-RFP05-02_LCP's_Short-Term_Proposal Page 3 of 24.
[28] *See* CEHE Response to HCC-RFP05-02 LCP's Short-Term Proposal 23 of 24 and DPS Short-Term Proposal Page 7 of 14.

conduct due diligence on the winning bidder and contracts should be signed and in place prior to diligent parties agreeing to spend millions of dollars a month. In fact, the lease agreement was not executed until September 1, 2021.[29]

Q. Can you describe the responses to the short-term RFP?

A. Yes, three (3) vendors responded to CEHE's request: Life Cycle Power ("LCP"), Distribute Power Solutions ("DPS"), and Voltagrid. [Begin Confidential] [redacted]



[redacted] [End Confidential]

[29] *See* Amended Direct Testimony of Martin W. Narendorf, Jr., Exhibit MWN-1.

Q. When did the vendors state that the generator assets would be delivered?

A. DPS stated [Begin Confidential] [redacted] [End Confidential]

Q. When did LCP deliver and commission the generation assets?

A. [Begin Confidential] [redacted] [End Confidential]

[30] *See* CEHE Response to HCC-RFP05-02DPS_Short-Term Proposal
[31] *See* CEHE Response to HCC-RFP05-02DPS_Short-Term Proposal page 8 of 14
[32] *See* CEHE Response to HCC-RFP05-02_LCP's_Short-Term_Proposal
[33] *See* CEHE Response to TCPA02_06
[34] *See* CEHE Response to TCPA03_05_Commissioning_Confidential.pdf

[redacted]

Q. Why did CEHE have such an aggressive delivery date of August 16th?

A. According to Mr. Narendorf, the aggressive delivery date for the short-term lease was to meet the 2021 Hurricane season. However, the National Weather Service has the hurricane season lasting from June to November. In 2021, eleven (11) of the twenty-one (21) named storms in the Atlantic occurred prior to September 1. So CEHE's goal was not achieved since the RFP was issued well after the start of the hurricane season. Further, LCP did not deliver commissioned units until mid-October.

Q. In your opinion, was this late delivery something that CEHE could reasonably foresee?

A. I believe CEHE should have known that the delivery date was not feasible. The contract was not signed until September 1, 2021.[35] Therefore delivery by August 16th was not feasible.

Q. What is your understanding as to why LCP was selected over DPS?

A. The key factor for the selection of the winning bid was the delivery date of the generators. [Begin Confidential] [redacted] [End Confidential]

Q. In your opinion, did the magnitude to the total capacity of the short-term lease impact the competitive bidding process?

A. Yes. Mr. Narendorf stated that CEHE's market research on market availability of procuring a total of 125-130 MW of mobile generation capacity seemed feasible.[38] The fact none of the bidders could meet the delivery date and one (1) of the bidders

[35] *See* Exhibit MWN-1 (Confidential).
[36] *See* CEHE Response to HCC-RFP05-02_LCP's_Short-Term_Proposal
[37] *See* CEHE Response to HCC_RFP05_02_Justification_Shortterm_(highly sensitive) Page 1 of 4
[38] *See* Amended Direct Testimony of Martin W. Narendorf, Jr., p. 14, lines 10-11.

could not provide the full 125 MW capacity. In fact, CEHE knew prior to the RFP being released that DPS did not have generation assets available by August 16th, 2021.[39] Clearly CEHE over-estimated the availability of mobile generation capacity in the market.

Q. In your opinion did the short-term lead time for responding to the RFP negatively affect competitive bidding?

A. Yes. The RFP was issued on a Friday with responses due on the following Monday. For competitive bids in the utility industry I normally see at least thirty (30) days for bid responses. In fact, CEHE provided thirty (30) days for responses to the Long-Term Lease RFP.[40] The following two (2) examples suggest reasonable times for vendors to respond to requests for proposals. Texas requires municipal governments acquiring goods or services valued at more than $50,000 to provide at least fourteen (14) days of public notice prior to bid opening.[41]. Texas acquisition regulations require a 21-day notice for purchases of goods or services valued at more than $25,000.[42]

Q. Do you agree that the short-term lease award to LCP was prudent and reasonable?

A. No. First, the time allotted to the vendors does not meet the minimum duration normally provided to vendors to bid on large complex proposals. Second, the delivery date of the generator assets prior to execution of a procurement contract is also not prudent for either party. It is obvious to those working in the industry that

[39] *See* CEHE Response to TCPA03-01 DPS Communication Confidential
[40] *See* CEHE Response to HCC_RFP05_02 LCP Longterm Proposal Highly Sensitive page 4 of 150
[41] *See* https://statutes.capitol.texas.gov/Docs/LG/htm/LG.252.htm.
[42] *See* https://statutes.capitol.texas.gov/Docs/GV/htm/GV.2155.htm.

delivery of these units within seven days of award is not feasible. As I pointed out earlier in my testimony, a super load transportation permit requires five business days to process. Third, the amount of capacity requested exceeded the availability of the local market within the time frame requested. Fourth, CEHE did not give adequate consideration to customers regarding the fact that [Begin Confidential] [redacted] [End Confidential]

Q. Can you provide an estimate for the lease cost if CEHE had selected DPS as the vendor?

A. Yes. If CEHE had selected DPS's bid, the cost for the lease of the 125 MW from Mid-October 2021 to December 31 would have been [Begin Confidential] [redacted] [End Confidential]

Q. Based on your analysis of the short-term lease bidding process, do you believe it meets the competitive bidding process required in PURA 39.918?

A. No. For the reasons previously stated, the bidding process, with an outrageously short turnaround time from RFP issuance to award and delivery, did not provide an environment conducive to soliciting competitive bids. This is further evidenced by the disparity in the bids between LCP and DPS.

Q. The total capacity of the short-term lease is 125 MW. Has CEHE justified this level of capacity?

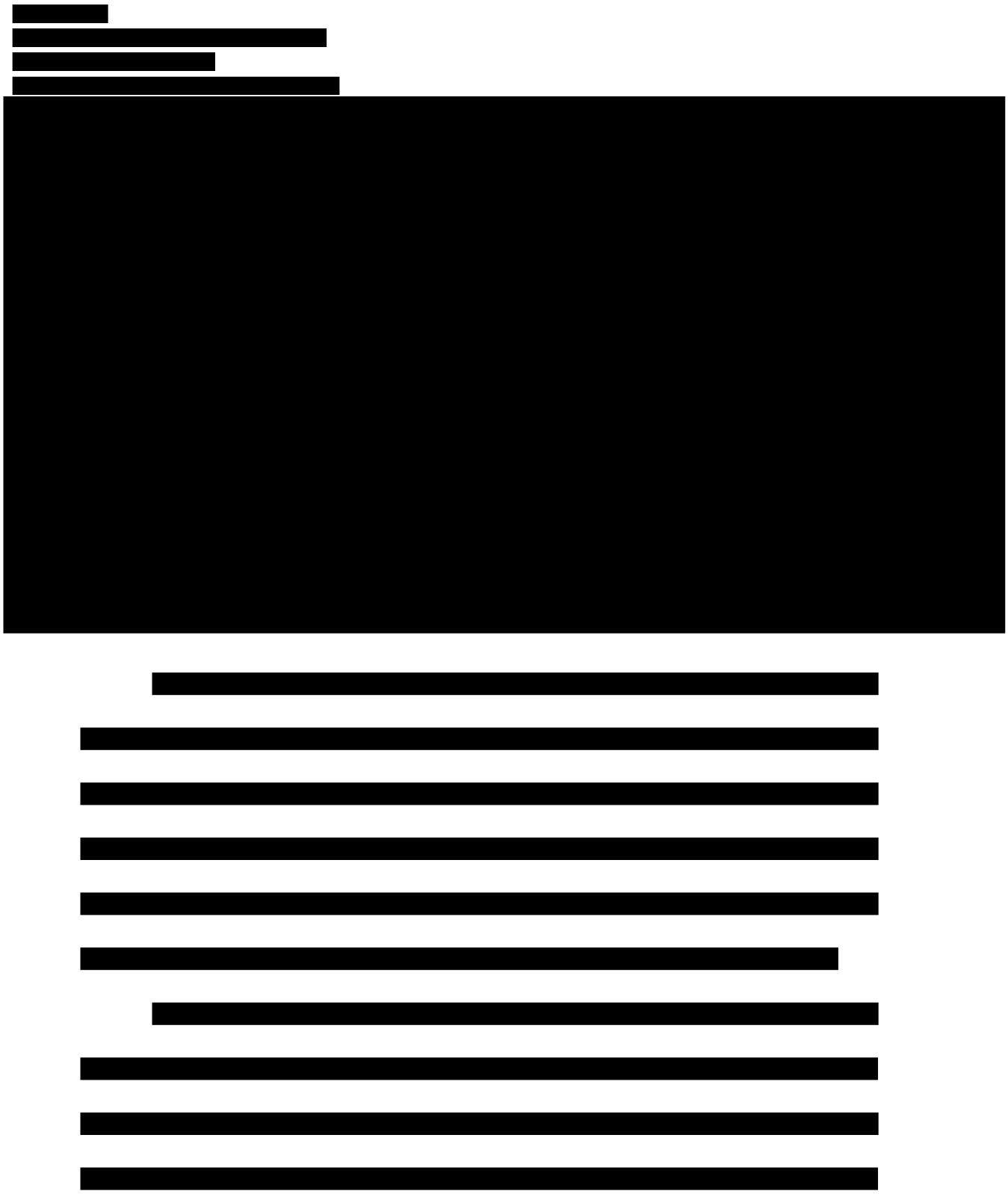
A. No. However, for this case, because the lease is a month to month, I recommend the Commission accept this level of capacity for 2021.

Q. Do you have a recommendation regarding the CEHE's application regarding this short-term lease?

A. Yes. I recommend that only $4,050,000 be approved related to the short-term lease.

Q. Was there an amendment to the short-term lease?

A. Yes. The original contract dated September 1, 2021, executed by CEHE and LCP was for leasing 125 MW of generation for two months. CEHE had the option to extend the initial term in one-month increments. Later, on December 31, 2021, an amendment was executed changing the original agreement with the addition of more generation assets and by changing the term of the lease. The amendment included [Begin Confidential] [redacted]



[redacted] [End Confidential]

Q. Did CEHE receive bids for this addition of 225 MW of capacity that is contained in the short-term lease extension of December 21, 2021?

A. No. CEHE did not bid this additional capacity to the market but rather sole sourced this 9-month lease to LCP with a contract value of [Begin Confidential] [redacted] [End Confidential] The original RFP did not indicate that the contract could be extended for additional capacity, nor did LCP offer any additional capacity in their original bid. [Begin Confidential] [redacted] [End Confidential] I noticed that the monthly lease rates for the generators offered by LCP in the short-term lease extension decreased [Begin Confidential] [redacted] [End Confidential]

Q. What is your recommendation regarding the short-term lease extension?

A. I recommend excluding the prepaid amounts for the short-term lease which are $3,830,395 as shown in Table MAK-2.[45] I recommend this because this capacity

[43] *See* Amended Direct Testimony of Martin W. Narendorf, Jr., Exhibit MWN-1.
[44] *Id.*
[45] *See* Amended Testimony of Jeff W. Garmon, p. 36, lines 1-3.

was not competitively bid as required by the PURA 39.918(f). Therefore, this cost should be excluded.

VI. LONG TERM LEASE

Q. Can you describe the schedule for responses and delivery contained in the long-term lease request for proposal?

A. Yes. [Begin Confidential] [redacted] [End Confidential] The lease term as described in the RFP was to be five (5) years.

Q. What were the technical requirements for the long-term lease RFP?

A. The key technical requirements include the following items:[48]

1. One (1) or more units capable of 2 MW or greater,
2. Delivery of generator sets no later than January 31, 2022,
3. Minimum of a 5-year lease,
4. Twenty-four (24) to forty-eight (48) hours to transport, deploy, operate and fully energized the equipment, and
5. Generators must be flex-fuel capable.

[46] See CEHE Response to HCC-RFP05-02_LCP_LongTerm_Highly Sensitive Page 4 of 150.
[47] See CEHE Response to HCC-RFP05-02_LCP_ShortTerm_Highly Senstive Page 3 of 24.
[48] See CEHE Response to HCC-RFP05-02_LCP_LongTerm_Highly Sensitive Page 6 of 150.

Q. Is it your understanding that all bidders meet these criteria?

A. No. In fact, I observed that none of the three (3) responses met the requirements for delivery dates and flex-fuel capability for all generators.

Q. What were the evaluation criteria shown in the RFP that described how CEHE would select the winning bidder?

A. The following criteria were presented in the RFP for evaluation of the bids:

1. Time to deploy during a widespread power outage.
2. Time required to make the generator operational and restore power to the deployed location.
3. Site preparation or site readiness requirements impacting the time required to restore power to the site.
4. Ability to operate equipment for the remaining duration of widespread power outages, flexibility of proposed lease terms and extension options.
5. Flexibility of proposed lease terms and extension options.
6. Annual price of initial lease term.
7. Ability to provide additional generation capacity during and/or in anticipation of a widespread power outage.

Q. Did CEHE provide a justification for selecting LCP for the long-term lease?

A. Yes. [Begin Confidential] [redacted] [End Confidential] CEHE also had a score card used to evaluate bidders.[50]

[49] *See* HCC-RFP05-01_Longtermsummary_confidential.
[50] *See* CEHE Response to HCC RFP05-02 Score Card

Q. What capacity did CEHE desire to obtain through the long-term lease?

A. The RFP for the long-term lease indicated that CEHE desired 500 MW of generation capacity with delivery no later than January 31, 2022.

Q. What did LCP and DSP offer relative to the 500 MW needed by January 31, 2022.?

A. [Begin Confidential] [redacted] [End Confidential]

Q. How were the proposals for LCP and DSP evaluated relative to the cost and delivery of 500 MW of capacity by January 31, 2022?

A. [Begin Confidential] [redacted][53]

[51] *See* CEHE Response to HCC RFP05-02 LCP Long-Term Lease Proposal page 58 of 150.
[52] *See* CEHE Response to HCC RFP05-02 DPS Long Term Lease Proposal …page 2/301
[53] *See* Response to CEHE Response to HCC RFP05-02 Score Card LongTerm

Q. How did the two (2) vendors score on the "Contract Negotiations"?

A. [Begin confidential] [redacted] [End Confidential]

Q. What were the results of the scoring for these two vendors?

A. [Begin confidential] [redacted] [End Confidential]

Q. What is your recommendation regarding the long-term lease?

A. I recommend excluding the prepayment of the long-term lease. The alternate bid provided a lower cost solution and could deliver the capacity to match the reasonable amount of generation capacity of 200 MW to 250 MW. Thus, I recommend that $175,466,076 be excluded from the 2021 rider.

Q. If the Commission accepts your recommendation regarding the pre-payment of the long-term lease will CEHE adversely affected for the entire term of 7.5 years?

A. The contract negotiated between CEHE and LCP includes an exit ramp that protects CEHE in the event a ruling creates an adverse event.[54] The specific clause states [Begin Confidential]:

[redacted]

[54] *See* Exhibit MWN-2 (HSPM) Long-term Lease Contract (Highly Sensitive).

[redacted] [End Confidential]

VII. RATE CASE EXPENSES

Q. What is the amount of rate case expense associated with GDS Associates, Inc. in this proceeding through August 31, 2022?

A. GDS Associates, Inc.'s professional fees through August 31, 2022, were $48,841.25. These fees were for time spent reviewing the application testimony, schedules and workpapers, discovery responses, developing discovery, developing issues, developing analyses and schedules, conferring with counsel, and conferring with other experts working on the case.

Q. Please identify the staff who charged professional hours to this case, their hourly rates and total hours billed.

A. My team of professionals included Steven Hunt, Linda Gray, and Waqas Salim. My team billed 224 hours to this case through August 31, 2022 using billing rates of $250.00 per hour or less.

I anticipate I will incur additional fees in the amount of $36,000.00 to complete this case. The estimated $36,000 reflects seventy-nine (79) actual hours for September, fifteen (15) estimated hours for September, twenty (20) estimated hours for October, twenty (20) estimated hours for November, and ten (10) estimated hours for December.

Q. Are your billing rate and time spent on tasks in this case reasonable?

A. Yes. My billing rate is reasonable and is the billing rate for services provided to similar clients. My rate is in the range of rates charged by other consultants with similar experience and is reasonable for consultants providing these regulatory and expert witness services in Texas.

My hourly billing rate is particularly reasonable given my qualifications and experience. I have forty (40) years of experience as a professional engineer, and I have testified in numerous cases dealing with the subject of reliability and resiliency of electric utility systems. I am a recognized National Electric Safety Code expert and an expert in electric utility reliability and resiliency.

Q. Do your charges include any of the types of charges that may be excludable?

A. No. I have included no out of pocket expenses at this time. My charges are entirely for professional fees.

Q. Was there any duplication of services or testimony?

A. No. I coordinated with the other city groups participating in this proceeding, so there has been no duplication of services or testimony.

Q. Do the issues raised in your testimony have a reasonable basis in law, policy, and fact?

A. Yes. The issues raised in my testimony are reasonably based in law, policy, and fact, being factually accurate and consistent with sound regulatory law and policy.

Q. What is your conclusion regarding GDS Associates, Inc.'s actual charges?

A. In my opinion, GDS' fees of $48,841.25 incurred through August 31, 2022, are reasonable and necessary and are not disproportionate, excessive, or unwarranted in

relation to the nature and scope of the filing.

Q. What is your conclusion regarding GDS Associates, Inc.'s estimated charges?

A. In my opinion, my estimate of professional fees of $36,000.00 to complete this case are reasonable and necessary and are not disproportionate, excessive, or unwarranted in relation to the nature and scope of the filing. These fees will include compiling information and data, developing and performing cost and bill impact analyses, participating in and preparing questions for CEHE's witnesses depositions and/or interviews, preparing testimony, schedules, attachments, and workpapers, filing direct testimony, responding to discovery, reviewing CEHE's rebuttal testimonies when filed, developing and reviewing discovery related to that testimony, participating in settlement discussions and providing settlement impact analysis, preparing for trial and testifying at trial, if necessary, and providing assistance with any post-hearing briefs if needed.

Q. Does your testimony address every potential issue in the case?

A. No. My testimony addresses a very limited scope of issues. My silence on other issues in the case should not be interpreted as my agreement on those issues.

Q. Does this conclude your testimony?

A Yes, with the preservation of the right to file an errata should additional answers to Requests for Information be received and rebuttal testimony, if necessary.

GDS Associates, Inc.
ENGINEERS & CONSULTANTS

KEVIN J. MARA, P.E.

Exec. Vice President & Principal Engineer

EDUCATION

BS Electrical Engineering, Georgia Institute of Technology, 1982

PROFESSIONAL MEMBERSHIPS

Institute of Electrical and Electronic Engineers Power Engineering Society – Senior Member

National Electric Safety Code Subcommittee 5 – Alternate Member

Past Member - Insulated Conductor Committee

PROFESSIONAL REGISTRATIONS

Registered Professional Engineer in Alabama, Arkansas, Georgia, Florida, Idaho, Indiana, Kansas, Kentucky, Louisiana, Michigan, Mississippi, Missouri, North Carolina, Ohio, Oregon, Pennsylvania, South Carolina, South Dakota, Tennessee, Texas, Virginia, Washington, and Wisconsin.

AREAS OF EXPERTISE

Mr. Mara has a strong background in system reliability and resiliency including storm hardening, expertise in the National Electric Safety Code, and alternate power sources such as solar, battery, and reciprocating distributed generation. He has developed interconnection requirements for various forms of generation, and has designed the interconnection of solar, battery, wind, and reciprocating distributed generation. He has provided consulting services regarding standby generation, hydro-electric generation, and solar/battery generation to delay capital investments.

DESIGN

Mr. Mara has over 30 years of experience as a distribution engineer. He worked six years at Savannah Electric as a Distribution Engineer and ten years with Southern Engineering Company as a Project Manager. At Savannah Electric, Mr. Mara gained invaluable field experience in the operation, maintenance, and design of transmission and distribution systems. While at Southern Engineering, Mr. Mara performed planning studies, general consulting, underground distribution design, territorial assistance, and training services. Presently, Mr. Mara is a Vice President at GDS Associates, Inc. and serves as the Principal Engineer for GDS Associates' engineering services company known as its trade name Hi-Line Engineering.

Overhead Distribution System Design

Mr. Mara is in responsible charge of the design of distribution lines for many different utilities located in a variety of different terrains and loading conditions. Mr. Mara is in responsible charge of the design of over 100 miles of distribution line conversions, upgrades, and line reinsulation each year. Many of these projects include acquisition of right-of-way, obtaining easements, and obtaining permits from various local, state and federal agencies. In addition, Mr. Mara performs inspections at various stages of completion of line construction projects to verify compliance of construction and materials with design specifications and applicable codes and standards.

Underground Distribution System Design

Mr. Mara has developed underground specifications for utilities and was an active participant on the Insulated Conductor Committee for IEEE. He has designed underground service to subdivisions, malls, commercial, and industrial areas in various terrains. These designs include concrete-encased ductlines, direct-burial, bridge attachments, long-bores, submarine, and tunneling projects. He has developed overcurrent and overvoltage protection schemes for underground systems for a variety of clients with different operating parameters.

PLANNING

Mr. Mara has prepared numerous planning studies for electric cooperatives and municipal systems in various parts of the country. The following is a representative list of specific projects:

- Little River Electric Cooperative, SC
  - Long Range Plan
  - Four Construction Work Plans
- Maxwell AFB, AL - Long Range Plan
- Fall River Electric, ID – Long Range Plan
- Chugach Electric, AK - Long Range Plan
- Newberry Electric Cooperative, SC - Construction Work Plan, Long Range Plan
- Lackland AFB, TX - Long Range Plan
- Rio Grande ECI, TX - Construction Work Plan, Long Range Plan
- Northern Virginia Electric Cooperative, VA - Construction Work Plan
- BARC Electric Cooperative - Construction Work Plan
- Dixie Electric Cooperative - Construction Work Plan
- Joe Wheeler Electric Cooperative - Construction Work Plan
- Cullman Electric Cooperative - Long Range Plan, Construction Work Plan

TRAINING SEMINARS

Mr. Mara has developed engineering training courses on the general subject of distribution power line design. These seminars have become extremely popular with more than 25 seminars being presented annually and with more than 4,000 people having attended seminars presented by Mr. Mara. A 3-week certification program is offered by Hi-Line Engineering in eleven states. The following is a list of the training material developed and/or presented:

- Application and Use of the National Electric Safety Code
- How to Design Service to Large Underground Subdivisions
- Cost-Effective Methods for Reducing Losses/Engineering Economics
- Underground System Design
- Joint-Use Contracts – Anatomy of Joint-Use Contract
- Overhead Structure Design
- Easement Acquisition
- Transformer Sizing and Voltage Drop

Construction Specifications for Electric Utilities

Mr. Mara has developed overhead construction specifications including overhead and underground systems for several different utilities. The design included overcurrent protection for padmounted and pole mounted transformers. The following is a representative list of past and present clients:

- Cullman EMC, Alabama
- Blue Ridge EMC, South Carolina
- Buckeye Rural Electric Cooperative, Ohio
- Three Notch EMC, Georgia
- Little River ECI, South Carolina
- Lackland Air Force Base
- Maxwell Air Force Base

System Privatization/Evaluation

- Central Electric Power Cooperative, Columbia, SC
  - 2017 Independent Certification of Transmission Asset Valuation, Silver Bluff to N. Augusts 115kV
  - 2015 Independent Certification of Transmission Asset Valuation, Wadmalaw 115kV
- Choctawhatchee Electric Cooperative, DeFuniak Springs, FL
  - Inventory and valuation of electrical system assets at Eglin AFB prior to 40-year lease to private-sector entity.

Publications

- Co-author of the NRECA "Simplified Overhead Distribution Staking Manual" including editions 2, 3 and 4.
- Author of "Field Staking Information for Overhead Distribution Lines"
- Author of four chapters of "TVPPA Transmission and Distribution Standards and Specifications"

Testimonies & Depositions

Mr. Mara has testified as an expert at trial or by deposition in the following actions.

- Deposition related to condemnation of property
  Newberry ECI v. Fretwell, 2005
  State of South Carolina

- Testimony in Arbitration regarding territory dispute
  Newberry ECI v. City of Newberry, 2003
  State of South Carolina
  Civil Action No. 2003-CP-36-0277

- Expert Report and Deposition, 2005
  United States of America v. Southern California Edison Company
  Case No CIV F-o1-5167 OWW DLB

- Expert Report and Deposition, 2005
  Contesting a transmission condemnation
  Moore v. South Carolina Electric and Gas Company
  United States District Court of South Carolina
  Case No. 1:05-1509-MBS

- Affidavit October 2007
  FERC Docket No. ER04-1421 and ER04-1422
  Intervene in Open Access Transmission Tariff filed by Dominion Virginia Power

- Affidavit February 26, 2008
  FERC Docket No. ER08-573-000 and ER08-574-000
  Service Agreement between Dominion Virginia Power and WM Renewable Energy, LLC

- Direct Filed Testimony date December 15, 2006
  Before the Public Utility Commission of Texas
  SOAH Docket No 473-06-2536
  PUC Docket No. 32766
- Expert Report and Direct Testimony April 2008
  United States Tax Court
  Docket 25132-06
  Entergy Corporation v. Commissioner Internal Revenue
- Direct Testimony September 17, 2009
  Public Service Commission of the District of Columbia
  Formal Case 1076
  Reliability Issues
- Filed Testimony regarding the prudency of hurricane restoration costs on behalf of the City of Houston, TX, 2009
  Cozen O'Connor P.C.
  TX PUC Docket No. 32093 – Hurricane Restoration Costs
- Technical Assistance and Filed Comments regarding line losses and distributive generation interconnection issues, 2011
  Office of the Ohio Consumer's Counsel
  OCC Contract 1107, OBM PO# 938 for Energy Efficiency T & D
- Technical Assistance, Filed Comments, and Recommendations evaluating Pepco's response to Commission Order 15941 concerning worst reliable feeders in the District of Columbia.
  2011, 2012 Office of the People's Counsel of the District of Columbia
  Formal Case No. 766
- Technical Assistance, Filed Comments, and Recommendations on proposed rulemaking by the District of Columbia PSC amending the Electric Quality of Service Standards (EQSS), 2011.
  Office of the People's Counsel of the District of Columbia
  Formal Case No. 766
- Yearly Technical Review, Filed Comments, and Recommendations evaluating Pepco's Annual Consolidated Report for 2011 through 2021.
  Office of the People's Counsel of the District of Columbia
  Formal Case Nos. 766; 766-ACR; PEPACR(YEAR)
- Technical Evaluation, Filed Comments, and Recommendations evaluating Pepco's response to a major service outage occurring May 31, 2011. (2011)
  Office of the People's Counsel of the District of Columbia
  Formal Case Nos. 766 and 1062
- Technical Assistance, Filed Comments, and Recommendations evaluating Pepco's response to Commission Order 164261 concerning worst reliable neighborhoods in the District of Columbia, 2011.
  Office of the People's Counsel of the District of Columbia
  Formal Case No. 766
- Technical Review, Filed Comments, and Recommendations on Pepco's Incident Response Plan (IRP) and Crisis Management Plan (CMP), 2011.
  Office of the People's Counsel of the District of Columbia
  Formal Case No. 766

- Technical Assistance, Filed Comments, and Recommendations assessing Pepco's Vegetation Management Program and trim cycle in response to Oder 16830, 2012.
  Office of the People's Counsel of the District of Columbia
  Formal Case No. 766
- Technical Review, Filed Comments, and Recommendations on Pepco's Secondary Splice Pilot Program in response to Order 16426, 2012.
  Office of the People's Counsel of the District of Columbia
  Formal Case No. 766 and 991
- Technical Review, Filed Comments, and Recommendations on Pepco's Major Storm Outage Plan (MSO), 2012 - active.
  Office of the People's Counsel of the District of Columbia
  Formal Case No. 766
- Technical Assistance and Direct Filed Testimony for fully litigated rate case, 2011-2012.
  Office of the People's Counsel of the District of Columbia
  Formal Case No. 1087 – Pepco 2011 Rate Case. Hearing transcript date: February 12, 2012.
- Evaluation of and Filed Comments on Pepco's Storm Response, 2012.
  Office of the People's Counsel of the District of Columbia
  Storm Dockets SO-02, 03, and 04-E-2012
- Technical Assistance and Direct Filed Testimony for fully litigated rate case, 2013 - 2014.
  Office of the People's Counsel of the District of Columbia
  Formal Case No. 1103 – Pepco 2013 Rate Case. Hearing transcript date: November 6, 2013.
- Evaluation of and Filed Comments on Prudency of 2011 and 2012 Storm Costs, 2013 – 2014.
  State of New Jersey Division of Rate Counsel
  BPU Docket No. AX13030196 and EO13070611
- Technical Assistance and Direct Filed Testimony for DTE Acquisition of Detroit Public Lighting Department, 2013 – 2014.
  Office of the State of Michigan Attorney General
  Docket U-17437
- Evaluation of and Filed Comments on the Siemens Management Audit of Pepco System Reliability and the Liberty Management Audit, 2014.
  Office of the People's Counsel of the District of Columbia
  Formal Case No. 1076
- Expert witness for personal injury case, District of Columbia
  Koontz, McKenney, Johnson, DePaolis & Lightfoot LLP
  Ghafoorian v Pepco 2013 - 2016
  Plaintive expert assistance regarding electric utility design. operation of distribution systems and overcurrent protection systems.
- Technical Assistance and Direct Filed Testimony in the Matter of the Application for approval of the Triennial Underground Infrastructure Improvement Projects Plan, 2014 – 2017.
  Office of the People's Counsel of the District of Columbia
  Formal Case No. 1116
- Technical Assistance and Direct Filed Testimony in the Matter of the Merger of Exelon Corporation, Pepco Holdings, Inc., Potomac Electric Power Company, Exelon Energy Delivery Company, LLC and New Special Purpose Entity, LLC, 2014 – 2016.
  Office of the People's Counsel of the District of Columbia
  Formal Case No. 1119. Hearing transcript date: April 21, 2015.

- Technical Assistance to Inform and advise the OPC in the matter of the investigation into modernizing the energy delivery system for increased sustainability. 2015 - active
  Office of the People's Counsel of the District of Columbia
  Formal Case No 1130.
- Technical Assistance and Direct Filed Testimony in the Matter of the Merger of Exelon Corporation and Pepco Holdings, Inc., 2014 – 2016.
  State of Maryland and the Maryland Energy Administration
  Case No. 9361.
- Technical Assistance and Direct Filed Testimony for fully litigated rate case, 2015 – 2016.
  State of Oklahoma Office of the Attorney General
  Cause No. PUD 201500273 - OG&E 2016 Rate Case. Hearing transcript date: May 17, 2016.
- Technical Assistance and Filed Comments on Notice of Inquiry, The Commission's Investigation into Electricity Quality of Service Standards and Reliability Performance, 2016 - 2018.
  Office of the People's Counsel of the District of Columbia
  Formal Case No. 1076; RM36-2016-01-E.
- Technical Assistance and Direct Filed Testimony for fully litigated rate case, 2016 - 2017.
  Office of the People's Counsel of the District of Columbia
  Formal Case No. 1139 – Pepco 2016 Rate Case. Hearing transcript date: March 21, 2017.
- Technical Assistance in the Matter of the Application for approval of the Biennial Underground Infrastructure Improvement Projects Plan, 2017.- active
  Office of the People's Counsel of the District of Columbia
  Formal Case No. 1145
- Technical Assistance to Inform and advise the OPC Regarding Pepco's Capital Grid Project, 2017 - active.
  Office of the People's Counsel of the District of Columbia
  Formal Case No. 1144. Confidential Comments and Confidential Affidavit filed November 29, 2017.
- Expert witness for personal injury case Mecklenburg County, NC
  Tin, Fulton, Walker & Owen, PLLC
  Norton v Duke, Witness testimony December 1, 2017
- Technical assistance and pre-filed Direct Testimony on behalf of the Joint Municipal Intervenors in a rate case before the Indiana Utility Regulatory Commission.
  Cause No. 44967. Testimony filed November 7, 2017.
- Prefiled Direct Testimony and Prefiled Surrebuttal Testimony on behalf of the Vermont Department of Public Service in a case before the State of Vermont Public Utility Commission, Tariff Filing of Green Mountain Power Corp.
  Case No. 18-0974-TF. Direct Testimony Filed August 10, 2018. Surrebuttal Testimony Filed October 8, 2018.
- Technical assistance and pre-filed Direct Testimony on behalf of McCord Development, Inc. and Generation Park Management District against CenterPoint Energy Houston Electric, LLC in a case before the State Office of Administrative Hearings of Texas.
  TX PUC Docket No. 48583. Direct Testimony filed April 5, 2019.

- Technical Assistance, Direct Filed Testimony, Rebuttal Testimony, Surrebuttal Testimony, and Supplemental Testimony for fully litigated rate case, 2019 – active.
  Office of the People's Counsel of the District of Columbia
  Formal Case No. 1156 – Pepco 2019 Rate Case. Direct Testimony Filed March 6, 2020. Rebuttal Testimony Filed April 8, 2020. Surrebuttal Testimony Filed June 1, 2020. Supplemental Testimony filed July 27, 2020.

- Technical assistance and pre-filed Direct Testimony on behalf of The State of Florida Public Counsel for Review of 2020-2029 Storm Protection Plan pursuant to Rule 25-6.030, F.A.C.
  Docket No. 20200071-EI.
  Gulf Power SPP. Direct Testimony filed May 26, 2020.
  Florida Power& Light Company SPP. Direct Testimony filed May 28, 2020.

- Prefiled Direct Testimony on behalf of the Vermont Department of Public Service in a case before the State of Vermont Public Utility Commission, Petition of Green Mountain Power for approval of its climate Plan pursuant to the Multi-Year Regulation Plan.
  Case No. 20-0276-PET. Direct Testimony Filed May 29, 2020.

- Technical assistance and Filed Comments on behalf of East Texas Electric Cooperative on a Proposal for Publication by the Public Utility Commission of Texas on Project 51841 Review of 16 TAC § 25.53 Relating to Electric Service Emergency Operations Plans.
  Project 51841. Comments filed January 4, 2022.

- Technical assistance, filed affidavit and direct testimony on behalf of Bloomfield, NM in an action concerning Bloomfield's exercise of its right to acquire from Farmington the electric utility system serving Bloomfield.
  Bloomfield v Farmington, NM. State of New Mexico, County of San Juan, Eleventh Judicial District Court Action No. D-1116-CV-1959-07581.

- Technical assistance and pre-filed Direct Testimony on behalf of Sawnee EMC in a territorial dispute with Electrify America.
  Public Service Commission State of Georgia, Sawnee Electric Membership Corporation v Georgia Power Corporation, Docket No. 43899. Direct Testimony Filed September 9, 2021

- Prefiled Direct Testimony on behalf of the Vermont Department of Public Service in a case before the State of Vermont Public Utility Commission, Petition of Green Mountain Power for approval of a Multi-Year Rate Plan pursuant to 30 V.S.A. Sections 209, 218, and 218d.
  Case No. 21-3707-PET. Direct Testimony Filed April 20, 2022.

- Technical assistance and pre-filed Direct Testimony on behalf of The State of Florida Public Counsel for Review of Storm Protection Plans pursuant to Rule 25-6.030, F.A.C.
  Docket No. 20220048-EI Tampa Electric Company
  Docket No. 20220049-EI Florida Public Utilities Company
  Docket No. 20220050-EI Duke Energy Florida
  Docket No. 20220051-EI Florida Power & Light
  All testimony filed May 31, 2022

- Technical assistance and pre-filed Direct Testimony on behalf of The State of Florida Public Counsel for Review of Storm Protection Plan Cost Recovery Clause.
  Docket No. 20220010-EI. Testimony filed September 2, 2022

WINTER STORM URI LOAD SHED

Time	Event	Net Ercot Total (MW)	Net CEHE Load Shed Share (MW)	Net CEHE Load Shed Share Less 500MW Generators (MW)
2/15/2021 1:20	ERCOT declares EEA3 and request Transmission Operators shed their share of 1,000 MW	1,000	248	0
2/15/2021 1:45	ERCOT declares EEA3 and request Transmission Operators shed their share of 1,000 MW (2,000 MW)	2,000	496	0
2/15/2021 1:50	ERCOT declares EEA3 and request Transmission Operators shed their share of 3,000 MW (5,000 MW)	5,000	1,240	740
2/15/2021 1:55	ERCOT declares EEA3 and request Transmission Operators shed their share of 3,500 MW (8,500 MW)	8,500	2,108	1,608
2/15/2021 2:00	ERCOT declares EEA3 and request Transmission Operators shed their share of 2,000 MW (10,500 MW)	10,500	2,604	2,104
2/15/2021 2:25	ERCOT request Transmission Operators restore their share of 1,500 MW (9,000 MW)	9,000	2,232	1,732
2/15/2021 4:30	ERCOT declares EEA3 and request Transmission Operators shed their share of 1,000 MW (10,000 MW)	10,000	2,480	1,980
2/15/2021 4:56	ERCOT declares EEA3 and request Transmission Operators shed their share of 1,500 MW (11,500 MW)	11,500	2,852	2,352
2/15/2021 5:12	ERCOT declares EEA3 and request Transmission Operators shed their share of 1,000 MW (12,500 MW)	12,500	3,100	2,600
2/15/2021 5:28	ERCOT declares EEA3 and request Transmission Operators shed their share of 1,000 MW (13,500 MW)	13,500	3,348	2,848
2/15/2021 6:32	ERCOT declares EEA3 and request Transmission Operators shed their share of 1,000 MW (14,500 MW)	14,500	3,596	3,096
2/15/2021 7:43	ERCOT declares EEA3 and request Transmission Operators shed their share of 1,000 MW (15,500 MW)	15,500	3,844	3,344
2/15/2021 7:54	ERCOT declares EEA3 and request Transmission Operators shed their share of 1,000 MW (16,500 MW)	16,500	4,092	3,592
2/15/2021 12:55	ERCOT request Transmission Operators restore their share of 500 MW (16,000 MW)	16,000	3,968	3,468
2/15/2021 13:28	ERCOT request Transmission Operators restore their share of 1,000 MW (15,000 MW)	15,000	3,720	3,220
2/15/2021 14:46	ERCOT request Transmission Operators restore their share of 1,000 MW (14,000 MW)	14,000	3,472	2,972
2/15/2021 17:19	ERCOT declares EEA3 and request Transmission Operators shed their share of 2,000 MW (16,000 MW)	16,000	3,968	3,468
2/15/2021 17:31	ERCOT declares EEA3 and request Transmission Operators shed their share of 2,000 MW (18,000 MW)	18,000	4,464	3,964
2/15/2021 18:27	ERCOT declares EEA3 and request Transmission Operators shed their share of 1,000 MW (19,000 MW)	19,000	4,712	4,212
2/15/2021 18:44	ERCOT declares EEA3 and request Transmission Operators shed their share of 1,000 MW (20,000 MW)	20,000	4,960	4,460
2/15/2021 20:42	ERCOT request Transmission Operators restore their share of 1,000 MW (19,000 MW)	19,000	4,712	4,212
2/16/2021 0:00	ERCOT request Transmission Operators restore their share of 500 MW (18,500 MW)	18,500	4,588	4,088
2/16/2021 0:30	ERCOT request Transmission Operators restore their share of 500 MW (18,000 MW)	18,000	4,464	3,964
2/16/2021 2:00	ERCOT request Transmission Operators restore their share of 500 MW (17,500 MW)	17,500	4,340	3,840
2/16/2021 2:50	ERCOT request Transmission Operators restore their share of 500 MW (17,000 MW)	17,000	4,216	3,716
2/16/2021 4:07	ERCOT declares EEA3 and request Transmission Operators shed their share of 1,500 MW (18,500 MW)	18,500	4,588	4,088
2/16/2021 7:04	ERCOT declares EEA3 and request Transmission Operators shed their share of 500 MW (19,000 MW)	19,000	4,712	4,212
2/16/2021 7:58	ERCOT declares EEA3 and request Transmission Operators shed their share of 500 MW (19,500 MW)	19,500	4,836	4,336
2/16/2021 10:18	ERCOT request Transmission Operators restore their share of 500 MW (19,000 MW)	19,000	4,712	4,212

WINTER STORM URI LOAD SHED

Time	Event	Net Ercot Total (MW)	Net CEHE Load Shed Share (MW)	Net CEHE Load Shed Share Less 500MW Generators (MW)
2/16/2021 10:53	ERCOT request Transmission Operators restore their share of 500 MW (18,500 MW)	18,500	4,588	4,088
2/16/2021 11:17	ERCOT request Transmission Operators restore their share of 1,000 MW (17,500 MW)	17,500	4,340	3,840
2/16/2021 11:58	ERCOT request Transmission Operators restore their share of 500 MW (17,000 MW)	17,000	4,216	3,716
2/16/2021 13:15	ERCOT request Transmission Operators restore their share of 500 MW (16,500 MW)	16,500	4,092	3,592
2/16/2021 13:34	ERCOT request Transmission Operators restore their share of 500 MW (16,000 MW)	16,000	3,968	3,468
2/16/2021 14:03	ERCOT request Transmission Operators restore their share of 1,000 MW (15,000 MW)	15,000	3,720	3,220
2/16/2021 17:37	ERCOT declares EEA3 and request Transmission Operators shed their share of 1,000 MW (16,000 MW)	16,000	3,968	3,468
2/16/2021 18:10	ERCOT declares EEA3 and request Transmission Operators shed their share of 1,000 MW (17,000 MW)	17,000	4,216	3,716
2/16/2021 22:15	ERCOT request Transmission Operators restore their share of 500 MW (16,500 MW)	16,500	4,092	3,592
2/16/2021 23:15	ERCOT request Transmission Operators restore their share of 500 MW (16,000 MW)	16,000	3,968	3,468
2/17/2021 0:00	ERCOT request Transmission Operators restore their share of 500 MW (15,500 MW)	15,500	3,844	3,344
2/17/2021 0:25	ERCOT request Transmission Operators restore their share of 500 MW (15,000 MW)	15,000	3,720	3,220
2/17/2021 1:20	ERCOT request Transmission Operators restore their share of 1,000 MW (14,000 MW)	14,000	3,472	2,972
2/17/2021 2:25	ERCOT request Transmission Operators restore their share of 500 MW (13,500 MW)	13,500	3,348	2,848
2/17/2021 7:42	ERCOT declares EEA3 and request Transmission Operators shed their share of 500 MW (14,000 MW)	14,000	3,472	2,972
2/17/2021 10:00	ERCOT request Transmission Operators restore their share of 500 MW (13,500 MW)	13,500	3,348	2,848
2/17/2021 10:40	ERCOT request Transmission Operators restore their share of 500 MW (13,000 MW)	13,000	3,224	2,724
2/17/2021 11:42	ERCOT request Transmission Operators restore their share of 1,000 MW (12,000 MW)	12,000	2,976	2,476
2/17/2021 12:18	ERCOT request Transmission Operators restore their share of 1,000 MW (11,000 MW)	11,000	2,728	2,228
2/17/2021 13:03	ERCOT request Transmission Operators restore their share of 1,000 MW (10,000 MW)	10,000	2,480	1,980
2/17/2021 14:12	ERCOT request Transmission Operators restore their share of 1,000 MW (9,000 MW)	9,000	2,232	1,732
2/17/2021 16:30	ERCOT request Transmission Operators restore their share of 1,000 MW (8,000 MW)	8,000	1,984	1,484
2/17/2021 17:00	ERCOT request Transmission Operators restore their share of 1,000 MW (7,000 MW)	7,000	1,736	1,236
2/17/2021 17:30	ERCOT request Transmission Operators restore their share of 1,000 MW (6,000 MW)	6,000	1,488	988
2/17/2021 19:35	ERCOT request Transmission Operators restore their share of 1,000 MW (5,000 MW)	5,000	1,240	740
2/17/2021 20:15	ERCOT request Transmission Operators restore their share of 1,000 MW (4,000 MW)	4,000	992	492
2/17/2021 21:10	ERCOT request Transmission Operators restore their share of 1,000 MW (3,000 MW)	3,000	744	244
2/17/2021 22:45	ERCOT request Transmission Operators restore their share of 1,000 MW (2,000 MW)	2,000	496	0
2/17/2021 23:20	ERCOT request Transmission Operators restore their share of 1,000 MW (1,000 MW)	1,000	248	0
2/17/2021 23:55	ERCOT request Transmission Operators restore their share of 1,000 MW. All load restored	0	0	0