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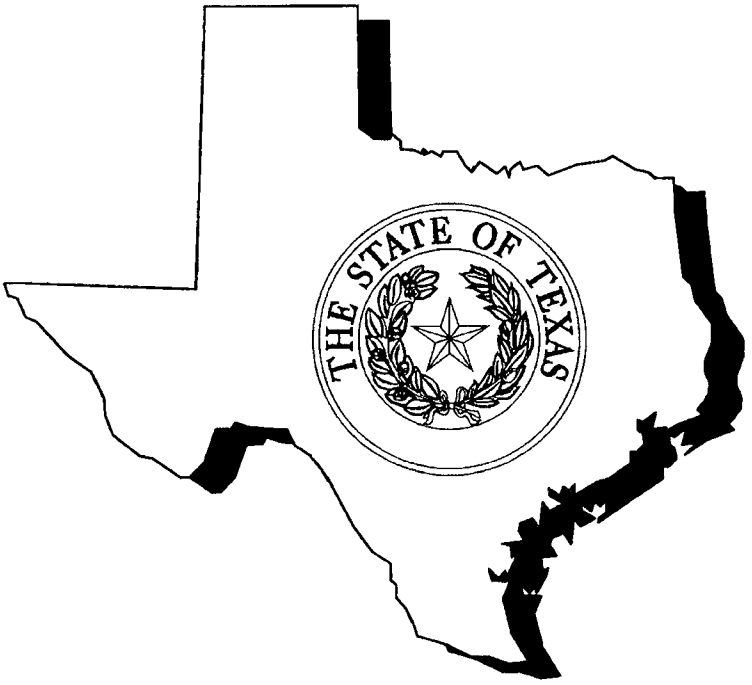
APPLICATION OF SOUTHWESTERN ELECTRIC POWER COMPANY FOR AUTHORITY TO CHANGE RATES	§ § §	BEFORE THE STATE OFFICE OF ADMINISTRATIVE HEARINGS



DIRECT TESTIMONY OF

RAMYA RAMASWAMY

INFRASTRUCTURE DIVISION

PUBLIC UTILITY COMMISSION OF TEXAS

APRIL 7, 2021

3391

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RR-1 Qualifications of Ramya Ramaswamy

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I. STATEMENT OF QUALIFICATIONS

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

A. My name is Ramya Ramaswamy. I am employed by the Public Utility Commission of Texas (Commission) as a Senior Engineering Specialist within the Infrastructure Division. My business address is 1701 North Congress Avenue, Austin, Texas 78701.

Q. Please briefly outline your educational and professional background.

A. I have a Master of Science degree in Mechanical Engineering. I completed my degree in May 2003, and I have been employed at the Commission since May 2019. A more detailed summary of my experience is provided in Attachment RR-1.

Q. Are you a registered professional engineer?

A. No.

Q. Have you previously testified as an expert before the Commission?

A. Yes. A list of my previous testimony is provided in Attachment RR-2.

II. PURPOSE OF TESTIMONY

Q. Please briefly describe the application.

A. Southwestern Electric Power Company (SWEPCO) filed an application with the Commission seeking authority to change its base rates. SWEPCO is a wholly owned subsidiary of AEP and is a vertically integrated electric utility providing service to 543,000 retail customers and six wholesale customers in Texas, Arkansas, and Louisiana.[1] Of those retail customers, 187,400 are in Texas.[2] Two of SWEPCO's six

[1] Application at 49 (October 14, 2020).

[2] *Id.*

1 wholesale customer contracts, which are regulated by the Federal Energy Regulatory
2 Commission (FERC), are with electric cooperatives in Texas.[3]

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

4 A. The purpose of my testimony is to address SWEPCO's distribution vegetation
5 management for its Texas system.

6 **Q. What information did you rely upon to reach your conclusions?**

7 A. I relied upon the application, responses to requests for information (RFIs), other
8 information provided by SWEPCO, information in other Commission dockets and
9 projects, and 16 Texas Administrative Code (TAC) §§ 25.52 and 25.231(b).

10 **Q. What issues identified by the Commission in the Preliminary Order of this docket**
11 **do you address in your testimony?**

12 A. I address the the following issue in the Preliminary Order filed on December 17, 2020:

13 49. Is it reasonable and necessary for SWEPCO to increase its expenditure for
14 its distribution vegetation management program by $5,000,000? If not,
15 what is a reasonable increase?[4]

16 **Q. Does your testimony include attachments?**

17 A. Yes, Attachments RR-1 and RR-2.

18

19 **III. DISTRIBUTION VEGETATION MANAGEMENT**

20 **A. BACKGROUND**

21 **Q. What is "vegetation management"?**

22 A. Vegetation management (VM) is the term for those activities associated with the

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[3] *Id.*

[4] Preliminary Order at 13 (Dec. 17, 2020).

1 trimming, removal, and control of plant vegetation on electric utility right-of-way
2 (ROW) to establish and maintain appropriate clearances between vegetation and
3 electric facilities.

4 **Q. Why is vegetation management important for a utility?**

5 A. Proper vegetation management is a crucial part of a utility's provision of safe, reliable
6 electric service. Adequate clearance distances between vegetation in utility ROWs and
7 electric equipment must be maintained to prevent vegetation from coming into contact
8 with an overhead line or other transmission or distribution facilities. For example,
9 service interruptions can occur when vegetation contacts an unshielded overhead
10 electric conductor. Some of these outages may be intermittent, as is the case when wind
11 causes a tree limb to sporadically contact a conductor. However, in other instances,
12 trees may break or fall directly onto power lines and create ground faults and damage
13 electric facilities, possibly causing fires. For these reasons, proper vegetation
14 management is necessary for the safety of utility personnel, customers, and the general
15 public and to maintain reliable electric service.

16 **Q. Are there Commission metrics by which service reliability is measured?**

17 A. Yes, 16 TAC § 25.52 uses two specific metrics: System Average Interruption Duration
18 Index (SAIDI) and System Average Interruption Frequency Index (SAIFI). SAIDI is
19 the average, total sustained interruption duration that customers experience during a
20 defined period of time. It is commonly measured in minutes.[5] SAIFI measures the
21 average number of sustained interruptions customers experience during a defined

[5] 16 TAC § 25.52 (c)(6)(B) defines SAIDI: The average amount of time a customer's service is interrupted during the reporting period. SAIDI is calculated by summing the restoration time for each interruption event times the number of customers interrupted for each event, and dividing by the total number of customers. SAIDI is expressed in minutes or hours. A lower SAIDI value represents a higher level of service reliability.

1 period of time.[6] The Commission has set SAIDI and SAIFI standards for forced,
2 sustained distribution interruptions.[7] Therefore, these metrics do not cover what are
3 defined as major events and outside causes or momentary interruptions.[8] The current
4 SAIDI and SAIFI standards that the Commission has set for SWEPCO are 137.17
5 minutes for SAIDI and 1.77 outages for SAIFI.[9]

6 **Q. What has been SWEPCO's SAIFI forced interruption performance?**

7 A. In his direct testimony, SWEPCO witness Drew Seidel stated that, for the test year
8 ending March 31, 2020, SWEPCO's SAIFI was 1.79, slightly more than the SAIFI
9 standard set by the Commission for SWEPCO (1.77 minutes).[10] The following graph
10 shows the SAIFI values over the past few years.[11]

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[6] 16 TAC § 25.52 (c)(6)(A) defines SAIFI: The average number of times that a customer's service is interrupted. SAIFI is calculated by summing the number of customers interrupted for each event and dividing by the total number of customers on the system being indexed. A lower SAIFI value represents a higher level of service reliability.

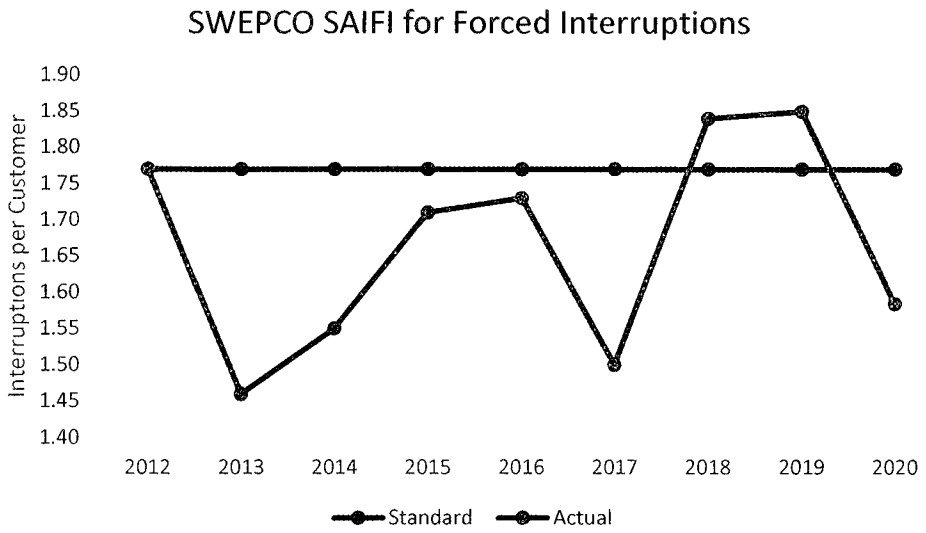
[7] 16 TAC § 25.52(c) includes the following definitions: Forced — Interruptions, exclusive of major events, that result from conditions directly associated with a component requiring that it be taken out of service immediately, either automatically or manually, or an interruption caused by improper operation of equipment or human error; Interruption, sustained — All interruptions not classified as momentary; and Interruption, momentary — Single operation of an interrupting device which results in a voltage zero and the immediate restoration of voltage.

[8] 16 TAC § 25.52(c) includes the following definitions for major events and outside causes: Major events — Interruptions that result from a catastrophic event that exceeds the design limits of the electric power system, such as an earthquake or an extreme storm. These events shall include situations where there is a loss of power to 10% or more of the customers in a region over a 24-hour period and with all customers not restored within 24 hours. Outside causes — Interruptions, exclusive of major events, that are caused by influences arising outside of the distribution system, such as generation, transmission, or substation outages.

[9] *Application of Southwestern Power Copmany to Adjust System-Wide Standards Pursuant to P.U.C. Subst. R 25 52*, Docket No. 40738, Order at 4 (Dec 13, 2012) (""SWEPCO's Application, as modified by Staff's recommendation, is approved."); Docket No. 40738, Commission Staff's Recommendation on Final Disposition of This Proceeding (Nov. 5, 2012).

[10] Direct Testimony of Drew W. Seidel at 10 (Oct 14, 2020) (Seidel Direct).

[11] *Service Quality Report in Accordance with Subst R. § 25 81, 2020 Reporting Year*, Project No. 51730, (Feb 12, 2021).

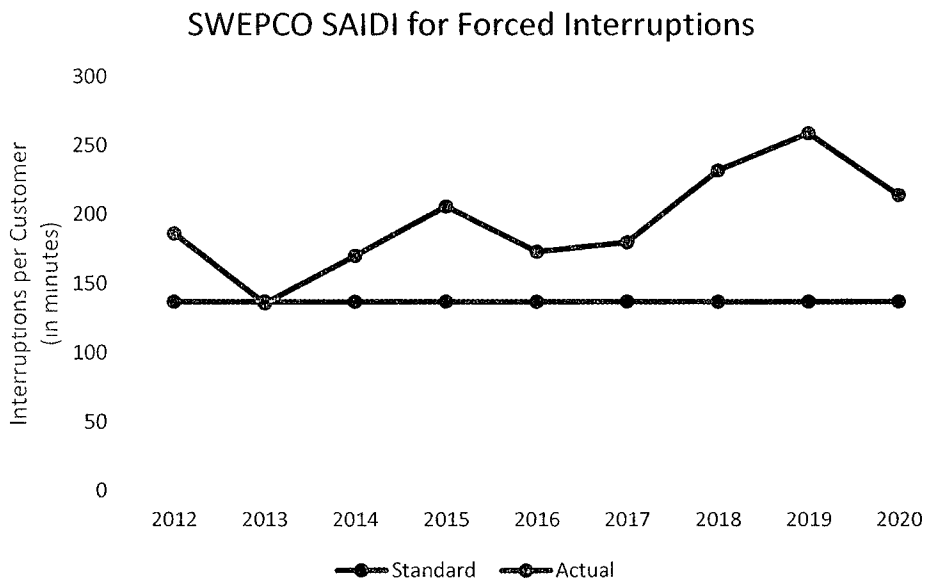


Q. What has been SWEPCO's SAIDI forced interruption performance?

A. SWEPCO has consistently exceeded the SAIDI standard that the Commission has set for SWEPCO (137.1691 minutes). In his direct testimony, Mr. Seidel stated that, for the test year ending March 31, 2020, SWEPCO's SAIDI was 252.61 minutes (4.2 hours), much higher than the SAIDI standard set by the Commission for SWEPCO (2.3 hours).[12] The following graph shows SWEPCO's SAIDI performance over the past nine years.[13]

[12] Seidel Direct at 10.

[13] *Service Quality Report in Accordance with Subst R § 25 81 2020 Reporting Year*, Docket No. 51730, Item No. 4 (Feb 12, 2021), *Service Quality Report in Accordance with Subst. R § 25.81 2019 Reporting Year*, Docket No. 50413, Item No. 9 (Feb 14, 2020), *2018 Electric Service Quality Reports Pursuant to 16 TAC 25 52 and 25.81*, Docket No. 49068, Item No. 11 (Feb 14, 2019), *2017 Electric Service Quality Reports Pursuant to 16 TAC §§25.52 and 25 81*, Docket No. 47924, Item No. 10 (Feb 14, 2018), *2016 Electric Service Quality Reports Pursuant to 16 TAC §25.52 and 25.81*, Docket No. 46717, Item No. 10 (Feb 14, 2017), *2015 Electric Service Quality Reports Pursuant to 16 TAC §25 52 and §25 81*, Docket No. 45516, Item No. 10 (Feb 12, 2016), *2014 Electric Service Quality Reports Pursuant to 16 TAC §25 52 and §25.81*, Docket No. 44021, Item No. 9 (Feb 13, 2015), *2013 Electric Service Quality Reports Pursuant to 16 TAC §25 52 and §25 81*, Docket No. 42146, Item No. 4 (Feb 12, 2014), *2012 Electric Service Quality Reports Pursuant to 16 TAC §25.52 and §25 81*, Docket No. 41092, Item No. 11 (Feb 14, 2013)



The SAIDI standard set by the Commission for SWEPCO is approximately 2.3 hours. In 2020, SWEPCO distribution customers experienced on average 3.6 hours of interruptions, not including outages caused by major events and outside causes or momentary interruptions. Similarly, it was 4.3 hours in 2019 and almost 4 hours in 2018 as shown in the table below.

	SAIDI – Forced (in Minutes)	Percentage Standard Was Exceeded
Standard	137.1691	
2018	232.1993	69.3%
2019	259.1160	88.9%
2020	214.0211	35.9%

Q. What is SWEPCO's explanation for the SAIDI increase in recent years?

A. Mr. Seidel in his direct testimony stated that the increase in restoration time is primarily caused by an increase in tree-related outages and the implementation of new safety

1 protocols that require specialized crews, such as forestry or line crews.[14] He has also
2 stated that system restoration requires more multi-person crews, which take additional
3 time to dispatch after the fault is identified. In addition, Mr. Seidel stated that vegetation
4 remains a major source of outages for SWEPCO, with both trees in ROW and trees
5 outside ROW increasing from 2017 through 2019 as a total percentage of the cause of
6 outages.[15]

7 **Q. What are the more specific causes of SWEPCO's interruptions?**

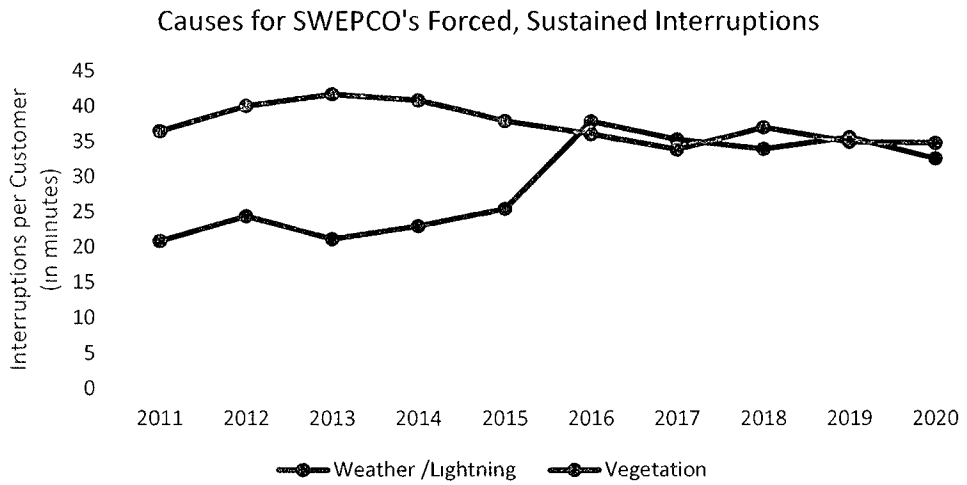
8 A. Mr. Seidel in his testimony stated that, "[d]espite increased spending on trimming and
9 significant improvements on circuits that have been trimmed, overall system SAIDI
10 and SAIFI have increased from 2016 through 2019 and remain highly susceptible to
11 weather-related events and increasing resource costs."[16] He also mentioned that during
12 the test year, " . . . vegetation accounted for 2,641 customer interruptions in SWEPCO's
13 Texas service territory, representing 40.1% and 49.1% of the Company's overall SAIFI
14 and SAIDI, respectively."[17] The average number of interruptions as a result of
15 weather/lightening and vegetation, is shown in the graph below.

[14] Seidel Direct at 11.

[15] *Id.*

[16] *Id.* at 19.

[17] *Id.*



Customers may also experience forced, sustained interruptions due to animals/birds, people/cars/farm equipment, utility-owned equipment, and other and unknown causes. Since weather and vegetation are the leading causes for SWEPCO's forced, sustained distribution interruptions, my testimony focuses on those two interruption causes.

B. PROSPECTIVE DISTRIBUTION VEGETATION MANAGEMENT

Q. What is the total amount that SWEPCO is requesting annually for distribution vegetation management as part of its operations and maintenance expenses?

A. SWEPCO is proposing a total annual vegetation management spend of $14.57 million.[18] This is an increase of $5.0 million over the $9.57 million in vegetation management expenses incurred in the test year.[19] According to Mr. Seidel, a total annual spend of $14.57 million is estimated to be approximately 38% of the spend needed to implement a four-year vegetation management cycle (i.e., to address all of

[18] *Id.* at 19.

[19] *Id.* at 18.

1 SWEPCO's distribution circuits within a four-year period).[20] The $5.0 million increase
2 requested by SWEPCO represents a 52% increase to what SWEPCO spent during its
3 test year.

4 **Q. Why is SWEPCO requesting an increase for distribution vegetation**
5 **management?**

6 A. Mr. Seidel requested additional distribution vegetation management spending to
7 provide improved reliability on "targeted" circuits.[21] Mr. Seidel stated that SWEPCO's
8 heavily forested service area, which requires substantial amounts of tree trimming,
9 requires increased vegetation management funding in order to achieve improved
10 reliability for its customers.[22] Also, Mr. Seidel described SWEPCO's northeast Texas
11 service territory as an area of rolling hills, heavy timber with tall pines and hardwood,
12 heavy vegetation, lakes, rivers, and streams. This area is subject to impacts from
13 hurricanes and tropical storms that move inland, such as Rita, Ike, Gustav, and Laura.
14 In addition, this area along with SWEPCO's Texas Panhandle service area is subject to
15 tornadoes, straight-line wind damage, and severe winter weather including ice storms.
16 Furthermore, SWEPCO's service area has low customer density. As a result, it takes
17 more line-miles to serve end-use customers than densely populated areas. Finally, Mr.
18 Seidel pointed out that SWEPCO's northeast Texas distribution system has some of the
19 heaviest levels of precipitation in the state. Rainfall levels can have a dramatic impact
20 on vegetation growth rates, which can affect reliability.[23]

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[20] *Id.* at 19.

[21] *Id.* at 21.

[22] *Id.*

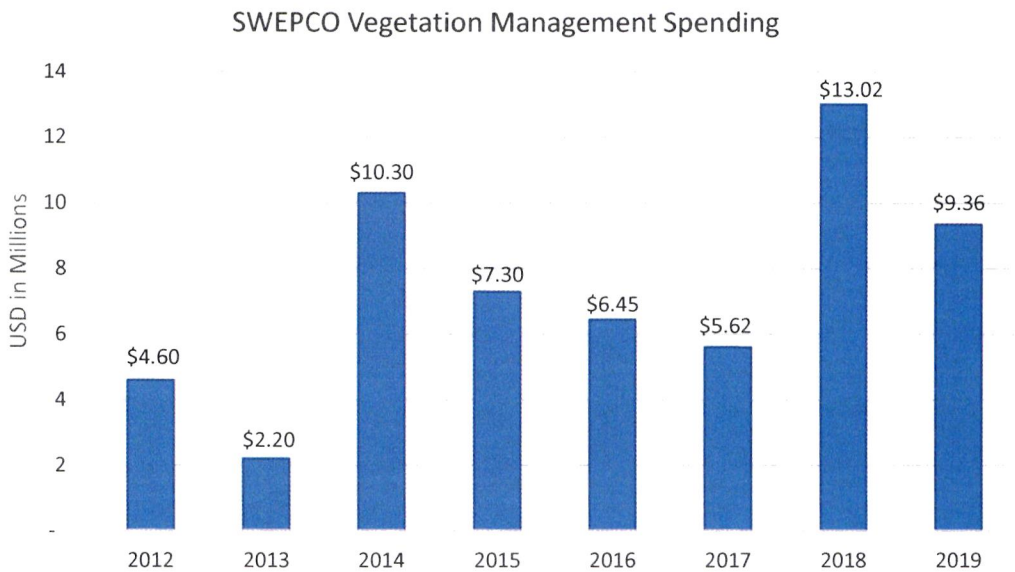
[23] *Id.* at 27-28.

Q. Has SWEPCO provided additional information about this requested increase?

A. Yes. In response to Staff RFI No. 11-1, SWEPCO submitted a confidential list of feeders targeted for vegetation management.[24]

Q. What has been SWEPCO's calendar year distribution vegetation management spending?

A. SWEPCO's vegetation management spending in the most recent ten years for which information is available is shown below.[25] The spending varied from a low of $2.20 million in total in 2013 to a high of $13.02 million in 2018.



Q. What did the Commission approve for distribution vegetation management in SWEPCO's last three base-rate cases?

[24] Southwestern Electric Power Company's Response to Commission Staff's First Request for Information (SWEPCO's Response to Staff's 1st RFI) at Staff 1-11 (Nov. 12, 2020).

[25] *Report on Electric Utility Distribution System Spending and Reliability*, Project No. 46735 at 60 (Oct. 6, 2020).

1 A. The Commission approved the additional amounts of money that SWEPCO requested
2 for distribution vegetation management:

Base-Rate Docket No.	Test-Year Amount (Million)	Additional Amount (Million)	Total Amount Approved (Million)	Percent Increase from Test Year
37364[26]	$1.7	$5.0	$6.7	294%
40443[27]	$4.7	$2.1	$7.3	45%
46449[28]	$7.3	$2.0	$9.3	27%
51415 (current case)	$9.6	$5.0 (requested)	$14.6 (requested)	52% (requested)

3

4 **Q. What do you recommend regarding SWEPCO's request for a vegetation**
5 **management increase?**

6 A. Based on the Commission's decision in SWEPCO's last base-rate case that approved
7 SWEPCO's request for money for targeted vegetation management in addition to the
8 test year amount spent on vegetation management, I recommend that the vegetation
9 management increase requested by SWEPCO be approved and that the additional $5.0
10 million be used solely for distribution vegetation management on SWEPCO's targeted
11 circuit on the list provided in response to Staff's RFI 11-1. In addition, I recommend

[26] *Application of Southwestern Electric Power Company for Authority to Change Rates*, Docket No. 37364, Order at 5 (Apr. 16, 2010). The additional amount was part of a settlement approved by the Commission that provided for a one-year surcharge for vegetation management and the surcharge revenues to be spent over a 24-month period. If, during the one year surcharge period, SWEPCO collected less than $10 million, SWEPCO was not obligated to expend on vegetation management activities more than the amount actually collected through the surcharge, other than the $1.7 million already included in base rates.

[27] *Application of Southwestern Electric Power Company for Authority to Change Rates and Reconcile Fuel Costs*, Docket No. 40443, Order on Rehearing at 34-35 (Mar. 6, 2014) .

[28] *Application of Southwestern Electric Power Company for Authority to Change Rates*, Docket No. 46449, Order on Rehearing at 36 (Mar. 19, 2018). In that docket, Staff supported increased vegetation management, but opposed increasing SWEPCO's rates for additional vegetation management money on the basis that the addition did not comply with the known and measurable requirement in 16 TAC § 25.231(b), which states in part: "In computing an electric utility's allowable expenses, only the electric utility's historical test year expenses as adjusted for known and measurable changes will be considered . . . ." *See also* Proposal for Decision at 256 (Sept. 22, 2017).

that the Commission order SWEPCO to provide periodic status reports in a compliance docket detailing how it is spending the additional amount of vegetation management expense allowed in its cost of service, and also report on the effect such additional spending is having on its distribution outage rates. In addition, recommend that SWEPCO file the periodic status reports consistent with Order No. 8 in Docket No. 50052, which established requirements for similar reports as a result of SWEPCO's last base-rate case.[29]

Q. Has SWEPCO provided sufficient information to demonstrate that it should implement more distribution vegetation management than it did during the test year?

A. Yes. SWEPCO's northeast Texas service area has heavy vegetation and more rainfall than other parts of the state. SWEPCO's SAIFI was 1.79 during the test year, slightly more than the SAIFI standard set by the Commission for SWEPCO (1.77 minutes). In addition, SWEPCO is consistently failing to meet its Commission-prescribed SAIDI standard for distribution forced, sustained interruptions and SWEPCO has identified vegetation as a primary cause for that failure.[30]

Q. If the Commission approves SWEPCO's distribution vegetation management request, will SWEPCO have an adequate vegetation management plan?

A. No. SWEPCO has stated that the best long-term solution for its vegetation management program is to adopt a four-year trim cycle.[31] A fundamental problem with SWEPCO's current approach to vegetation management is that it targets feeders that are already

[29] *Compliance Report on Southwestern Electric Power Company in Accordance with the Order on Rehearing in Docket No. 46449*, Docket No. 50052, Order No. 8 at 1 (June 9, 2020).

[30] Seidel Direct at 11.

[31] *Id.* at 20.

susceptible to or having problems but does not try to proactively prevent problems in a comprehensive manner. Mr. Seidel stated that "after four years, trees and vegetation have grown back and begin touching the conductor again, making it susceptible to outages occurring from weather-related events".[32] Unless SWEPCO adopts the four-year trim cycle, SWEPCO will be in a "reactive vegetation management program that is based on specific historical performance of a given line instead of a more proactive vegetation management program."[33]

Q. Do you recommend that the Commission order SWEPCO take additional action on distribution vegetation management?

A. Yes. I recommend the Commission order SWEPCO to implement a four-year trim cycle within 12 months of the filing of the final order in this proceeding.

IV. CONCLUSION

Q. Please summarize your recommendations.

A. Based on my analysis, I am recommending the Commission take the following actions:

- Approve an increase of $5.0 million over the $9.57 million in vegetation management expenses incurred in the test year.
- Open a compliance docket in which SWEPCO is required to file periodic reports detailing how it is spending the additional amount of vegetation management expense allowed in its cost of service and also report on the effect such additional spending is having on its distribution outage rates, in a manner

[32] *Id.*

[33] *Id.*

1 consistent with Order No. 8 in Docket No. 50052, which established
2 requirements for similar reports as a result of SWEPCO's last base-rate case.[34]
3 • Order SWEPCO to implement a four-year trim cycle within 12 months of the
4 filing of the final order in this proceeding.

5 **Q. Does this conclude your testimony?**

6 A. Yes.

[34] Docket No. 50052, Order No. 8 at 1.

ATTACHMENT RR-1

Qualifications of Ramya Ramaswamy

In May 2000, I received a Bachelor of Science degree in Mechanical Engineering from Bharathiyar University in Coimbatore, Tamil Nadu, India. In December 2004, I earned my Master of Science degree in Mechanical Engineering from Texas A&M University in College Station, Texas. My Master's thesis focused on loss of bone density and mechanical strength of bones due to osteoporosis, weightlessness in space, and during prolonged bedrest.

Upon completion of my Master's, I worked for Thermo Fisher Scientific for more than twelve years in the Research and Development (R&D) division. My primary duties included designing analyzers for coal, cement, nuclear, and oil industries. I was responsible for identifying and analyzing design issues, designing the analyzer, planning, and sourcing materials and vendors that would best suit my design. I was also tasked with identifying new national and international vendors to manufacture various parts of the analyzers, assembling and testing the analyzer in-house and in the field to meet customer and company standards, and releasing it to manufacturing and the market. Additionally, I provided engineering support to the field team, the marketing, and the manufacturing team with regards to any technical issues related to the design and assisted with the installation and mechanical aspects of the analyzers.

Prior to accepting my current role at the Public Utility Commission of Texas, I worked as a Manufacturing Engineer at Applied Materials and as a Senior Consultant at a supply chain consulting firm. I joined the Public Utility Commission of Texas in May 2019 as an Engineering Specialist in the Infrastructure Division.

ATTACHMENT RR-2

List of Previous Testimony

Docket No. 49603 – *Application of Upshur Rural Electric Cooperative Corporation to Amend its Certificate of Convenience and Necessity for a 138-kV Transmission Line in Harrison County (Hallsville – Gum Spring)*

Docket No. 50714 – *Application of Entergy Texas, Inc. to Amend its Distribution Cost Recovery Factor*

Docket No. 50669 – *Application of Southwestern Electric Power Company to Amend its Certificate of Convenience and Necessity for the SWEPCO Morton Cut-In to the Wood County Electric Cooperative E Burges Cut-In 138-kV Transmission Line in Van Zandt County*

Docket No. 50410 – *Joint Application of Wind Energy Transmission Texas, LLC and Oncor Electric Delivery Company LLC to Amend their Certificates of Convenience and Necessity for the Bearkat Switching Station-to-Longhorn Switching Station 345-kV Transmission Line in Glasscock and Howard Counties*

Docket No. 50830 – *Application of Guadalupe Valley Electric Cooperative, Inc. to Amend its Certificate of Convenience and Necessity for a 138-kV Transmission Line in Caldwell and Gonzales Counties (Delhi-to-Bluestem 138-kV Transmission Line)*