

**BEFORE THE ARKANSAS PUBLIC SERVICE COMMISSION**

IN THE MATTER OF THE APPLICATION OF )  
**OKLAHOMA GAS AND ELECTRIC COMPANY** )  
FOR APPROVAL OF A GENERAL CHANGE IN ) DOCKET NO. 16-052-U  
RATES, CHARGES AND TARIFFS )

Direct Testimony

of

Jarod Cassada

on behalf of

Oklahoma Gas and Electric Company

Jarod Cassada  
*Direct Testimony*

I. INTRODUCTION

Q. **Please state your name and business address.**

A. My name is Jarod Cassada. My business address is 3220 South High Avenue, Oklahoma City, Oklahoma 73129.

Q. **By whom are you employed and in what capacity?**

A. I am employed by Oklahoma Gas and Electric Company ("OG&E" or "Company") as Supervisor, Vegetation Management.

Q. **Please summarize your educational background and professional qualifications.**

A. I obtained a Bachelor's of Science in Forestry and a Minor in Soils/Agronomy from Oklahoma State University in 1996 and a Master's in Business Administration from the University of Central Oklahoma in 2016. I am a Registered Professional Forester with the Oklahoma Department of Agriculture, Food and Forestry ("ODAFF") (License No. 203), an International Society of Arboriculture ("ISA") Certified Arborist (License No. MW0422A) and an ISA Utility Specialist (License No. MW0422AU). I am a Certified Pesticide Applicator with the Oklahoma Department of Agriculture ("ODA") License No. 01020. I am a graduate of the Oklahoma Citizens Academy, which is an academy sponsored by the Oklahoma Municipal League. I have been with OG&E since 2011. Prior to assuming my current position at OG&E, I was employed by American Electric Power from 1995 to 2011 in the areas of Transmission or Distribution as a Forester and in Distribution as Senior Engineer Technician. In those positions, I managed regional contract line clearance operations and designed electrical facilities to meet the demands of new and existing customers.

Q. **What are your principal duties and responsibilities for the Company?**

A. I manage vegetation management budgets, contracts and activities on OG&E's distribution and transmission system. I ensure compliance with federal and state vegetation management requirements, regulations, and rules under the authority of

1 NERC, the Federal Energy Regulatory Commission (“FERC”), and the Environmental  
2 Protection Agency (“EPA”).  
3

4 Q. **Have you previously filed testimony before the Arkansas Public Service Commission**  
5 **(“APSC” or “Commission”)?**

6 A. No. I have not previously testified before the APSC, but I have testified before the  
7 Oklahoma Corporation Commission in Cause No. PUD 201500273.  
8

9 Q. **What is the purpose of your testimony?**

10 A. I provide an overview of electric utility vegetation management, describe the methods  
11 used to manage vegetation on the system, and discuss the importance of establishing a  
12 cost effective cycle on the distribution system to improve safety and reliability. I also  
13 quantify the growth in OG&E’s Transmission and Distribution infrastructure and the  
14 factors which impact vegetation management. Finally, I explain the basis for the  
15 Company’s request in this case which results in *pro forma* expense adjustment.  
16

## 17 II. VEGETATION MANAGEMENT OVERVIEW

18 Q. **Please provide a brief overview of utility vegetation management.**

19 A. Utility vegetation management is a combination of different methods to manage  
20 vegetation near power lines and substations. Specifically, vegetation management is the  
21 integration of various control methods for the purpose of managing “space” around the  
22 conductors and other system infrastructure to prevent interruptions. That space has a  
23 finite life expectancy and must be reclaimed on a cyclical basis. Failure to do so impacts  
24 OG&E’s ability to deliver safe, reliable and affordable electricity. Vegetation near power  
25 lines poses safety hazards as it gives the public potential access to high voltage facilities  
26 and/or can damage facilities placing the public and utility workers at risk of serious injury  
27 or death. Vegetation management also prevents or reduces the severity of outages, which  
28 adversely affect customers because they disrupt, and sometimes halt, commercial activity  
29 and degrade quality of life. When determining the extent of vegetation management,  
30 OG&E considers several factors including: line voltage class, vegetation species’ growth  
31 rates and failure characteristics, right-of-way limitations, the vegetation’s location in  
32 relation to the conductors, the potential combined movement of vegetation and

conductors during routine winds, and sagging of conductors due to elevated temperatures or icing.

**Q. What are some constraints when performing line clearance on OG&E's power delivery system?**

A. When conducting vegetation management on the power delivery system, OG&E must generate enough space around the conductors to facilitate the safe, reliable operation of the power delivery system between line clearance events. Many trees "encroach" from outside the easement and require pruning at each cycle event. Other trees emanate from directly beneath the lines. Failure to manage these trees results in an increasing number of future trees that will need to be addressed over time. As the number of trees increase due to fire suppression and land use changes, so does the source of seeds contributing to more "volunteer" trees. These seeds are deposited by nearby trees, wind or birds roosting on power lines. These volunteer trees that establish themselves under the power lines are generally varieties that grow quickly with weak or brittle wood. In addition, the distribution system often shares space with other utilities, and our vegetation management activities must account for private landscaping, fences, boundaries and specific property uses. A significant portion of the system requires access from private property which OG&E has a notification and education program for those owners or customers impacted by line clearance operations.

**Q. What standards and regulations drive the need for vegetation management?**

A. Several standards and regulations drive the need for vegetation management. These regulations come mainly from the National Electric Safety Code ("NESC"),<sup>1</sup> NERC,<sup>2</sup> and the American National Standards Institute ("ANSI").<sup>3</sup>

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<sup>1</sup> NESC Standard 218A1

<sup>2</sup> Reliability Standard FAC-003-3

<sup>3</sup> ANSI A300 (part 7), ANSI Z133-2012

1 Q. **Please describe the various control methods OG&E uses to maintain its**  
2 **transmission and distribution lines.**

3 A. OG&E utilizes mechanical, chemical, and cultural control methods in its vegetation  
4 management processes. Mechanical control includes the manual clearing of vegetation  
5 from areas around power lines with saws and pruners. It also includes the use of large  
6 machinery to mechanically prune or mulch whole trees. Chemical control is the use of  
7 selective herbicides to manage the vegetation that will interfere with the system.  
8 Chemical management may also include the use of tree growth regulators (“TGR”s) to  
9 temporarily manipulate the speed at which a tree may re-grow towards the power lines.  
10 Cultural control is promotion of low growing vegetation and grasses to interfere with  
11 vegetation that is not compatible with power lines.  
12

13 Q. **Please describe how costs are directly tied to vegetation growth.**

14 A. As vegetation develops and becomes larger, it has a greater capacity for re-growth and  
15 becomes more costly to maintain. The most cost effective vegetation management is to  
16 target immature trees for removal or control. It generally costs less to treat or remove  
17 immature trees than to trim them repeatedly. By removing a tree, the cost to prune that  
18 tree during the next line clearance event is avoided and every line clearance event  
19 thereafter. Mature trees may also be good candidates for removal due to declining health,  
20 proximity to poles and/or equipment, rate of re-growth, or are unsightly when trimmed  
21 near power lines and elicit negative public comment. Rights-of-way that are free and  
22 clear of vegetation demonstrate a well maintained system and, in fact, do reduce the costs  
23 of upgrades, maintenance and/or storm restoration as well as promote safe operating  
24 conditions and speed outage recovery and service restoration after catastrophic events.  
25

26 Q. **Please describe the notification and education program OG&E utilizes.**

27 A. Reasonable efforts are made to communicate with the resident or property owner in  
28 advance of work to be completed. After work is completed, OG&E contractors may leave  
29 an additional door card for the property owner to rate their satisfaction and/or request  
30 additional follow up information. In addition to OG&E’s notification program, OG&E  
31 also retains the services of a contract vegetation management specialist to answer the

1 hundreds of inquiries and requests specific to vegetation and power lines and to make site  
2 visits as necessary.

3  
4 **III. OG&E'S TRANSMISSION AND DISTRIBUTION SYSTEMS**

5 **Transmission**

6 **Q. Please give a brief overview of the OG&E transmission system.**

7 **A.** OG&E has approximately 5,152 miles of transmission line as of December 31, 2015.  
8 The transmission system is a series of poles, structures and conductors designed to  
9 transmit and move high voltage electricity from power plants or the grid to substations or  
10 large consumers of energy. The system is managed using a combination of the  
11 vegetation clearing cycle and a robust inspection program which allows OG&E to  
12 identify and manage vegetation problems before they cause interference.

13  
14 **Q. Please explain the changes to the OG&E transmission system since 2010.**

15 **A.** At the end of 2010, OG&E had 4,487 miles of transmission lines, including 958 miles of  
16 345-500kV line. OG&E currently has 5,166 miles of transmission lines, including 1551  
17 miles of 345-500kV line. This constitutes a 15 percent growth in the overall transmission  
18 system, but a 62 percent increase in transmission lines regulated under NERC FAC-003-3  
19 which includes OG&E's 345 kV and greater lines. The table below gives an overview of  
20 the transmission line expansion that has occurred from 2010-present.

**Chart 1**

<b>Voltage</b>	<b>2010 Miles</b>	<b>2015 Miles</b>	<b>Miles Increase</b>	<b>% Increase</b>
<b>69-161kV</b>	3529	3615	86	2%
<b>345-500kV</b>	958	1551	593	62%
<b>Total</b>	4487	5166	679	15%

21 **Q. Will there continue to be additions to the transmission system?**

22 **A.** Yes. The OG&E Transmission System is projected to increase to 5,342 miles by 2020.



Distribution

Q. **Please give a brief overview of OG&E's distribution system in Arkansas**

A. In Arkansas, the distribution system consists of primary (7,200V to 34,500V) and secondary conductors (<750V) that generally reside on the same structures except where a conductor leaves the structure to service a customer (service drop). The distribution system is often located on or adjacent to residential properties and creates unique challenges for OG&E when maintaining or accessing vegetation near these lines. Since the last Arkansas rate case, overhead distribution miles on the OG&E system have increased by approximately 24 percent. OG&E manages grass and bare-ground at 38 Arkansas substations. OG&E also conducts vegetation management activities on approximately 83 circuits covering 1530 miles of Arkansas right-of-way.

Q. **How does OG&E currently manage vegetation on its distribution system?**

A. The system is managed by prioritizing work. Outages and hazardous conditions receive the highest priority. Reliability requests receive the next level of priority and, similar to outages, work is targeted to specific areas on a circuit. Full circuit clearance is completed on circuits that are identified based on reliability and is managed between higher priority requests. Management methods include the mechanical, chemical and cultural practices discussed above.

V. IMPACTS ON RELIABILITY

Q. **How does OG&E measure reliability of their distribution system?**

A. System reliability is measured using different reliability indices. Two indices used for monitoring reliability impacts from vegetation are System Average Interruption Duration Index ("SAIDI") and System Average Interruption Frequency Index ("SAIFI"). SAIDI measures the average time per year in minutes that OG&E customers are without service. SAIFI measures the average number of interruptions a customer experiences.

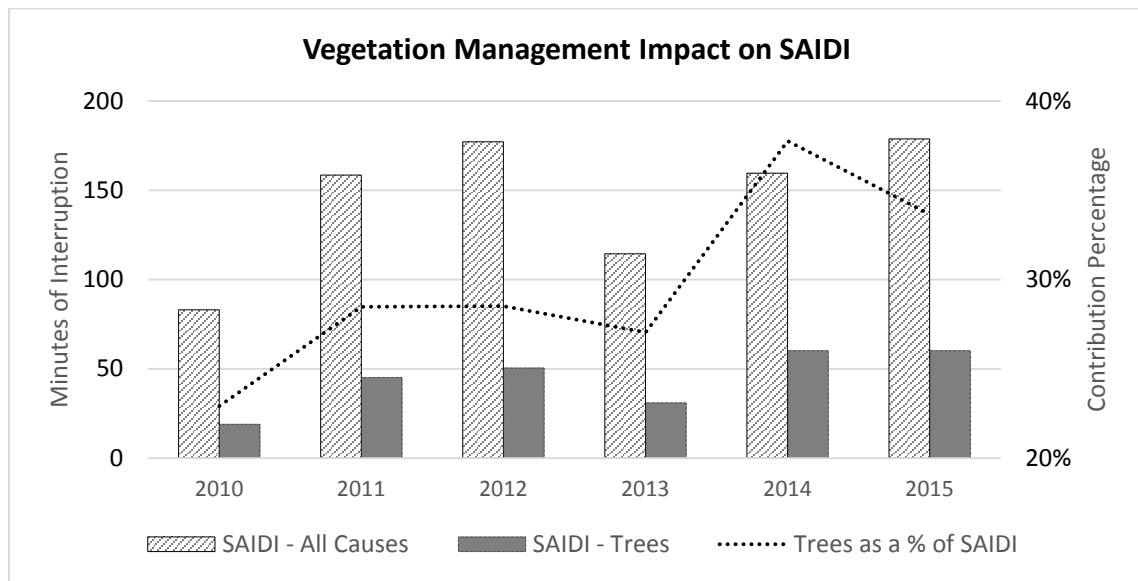
Q. **How does vegetation impact reliability indices?**

A. There are multiple ways to categorize the cause of an outage, i.e. animal, trees, lighting, etc. However, unlike other causes, trees can impact duration of restoration regardless of the outage cause. Any restoration, regardless of cause, can be extended by an overgrown



easement. Assessment, access, and ease of repair can all be impacted by the condition of the right of way. Trees also impact the severity of major events and can have a large impact on cost and expedience of service restoration. Chart 3 shows the relative contribution trees have had on SAIDI across the Distribution system in Arkansas since 2010. Specifically, trees are having a greater impact on reliability. The chart excludes major events on the system.

Chart 3



**Q. What other factors are contributing to the increasing impact of vegetation on reliability indices?**

A. Contributing factors are: increasing contractor costs, increasing growth of distribution line miles (as discussed above), and increases in customer requests for tree work. With more miles of work and a higher work cost per tree, fewer trees can be cleared around power lines with the historical funding levels.

**Q. Please explain contractor cost increases.**

A. OG&E uses contractors to complete 100% of its line clearance work. OG&E is able to achieve the best price possible with the greatest flexibility using skilled contract labor, however, over the last five years contractor costs have increased by approximately 20%. Additionally, OG&E has experienced uncertainty with the availability of its vegetation contractors, which are a highly specialized workforce, in high demand by all regional

1 utilities. This demand, and therefore the cost increases, is driven by regional factors such  
2 as weather and competition for contractors.

3  
4 **Q. Please describe how customer requests impact distribution line clearance costs.**

5 A. The Company experienced a growing volume of customer requests for tree work that  
6 come through the customer service call center. In particular, customers are increasingly  
7 more sensitive to power interruptions and requests for preventative work increases before  
8 predicted weather events. Other types of requests may include the need to remove trees  
9 for customer construction projects and/or for trees that are dead and need to be made safe.  
10 This increase has impacted not only maintenance scheduling, but overall costs. While  
11 OG&E knows it needs to address customer requests, it cannot plan for the complexity or  
12 location of where they will occur. Customer requests disrupt planned work, notification,  
13 and completion schedules. These requests require unplanned travel, planning, access,  
14 and may result in remediation using less than optimal equipment (*i.e.* climbing crew used  
15 where a bucket could be used) due to availability in the area, which drives up the cost to  
16 work each tree.

17  
18 **Q. Is OG&E making any changes to the way it manages vegetation on its distribution**  
19 **system to mitigate the factors listed above?**

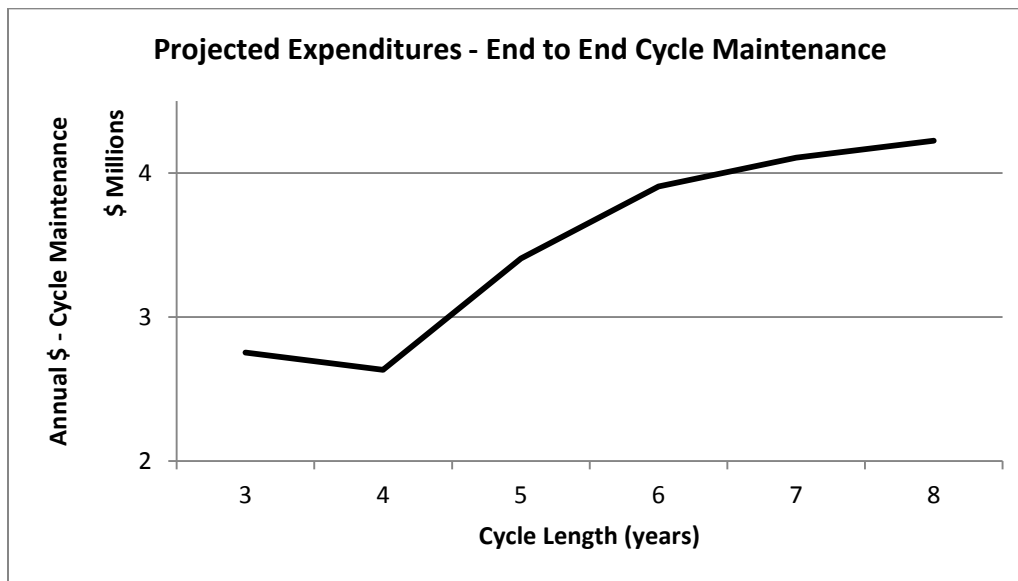
20 A. Yes, OG&E is targeting a 4 year cycle to manage vegetation on the Arkansas distribution  
21 system.

22  
23 **Q. Please explain how targeting a 4 year cycle will mitigate the factors above and**  
24 **improve reliability.**

25 A. OG&E has completed an analyses that indicates that a 4 year cycle length is optimal for  
26 controlling both cost and managing tree growth near power lines. Cycle lengths longer  
27 than 4 years result in reduced reliability and increased costs of maintenance. Cycles  
28 shorter than 4 years result in improved reliability but at an increased cost and, often,  
29 inconvenience to the customer. Pruning a tree from the power lines provides clearance  
30 for a finite period of time. The clearance obtained from pruning is related to the cycle  
31 length, the regrowth rate for the particular species and the site conditions (such as  
32 easement widths and customer tolerance for clearance distances). Once the tree re-grows,

1 it must be trimmed again (*i.e.*, on cycle or once every four years). Clearing the  
2 distribution system on a cycle reduces the amount of more costly reactive work, reduces  
3 the impact from severe storms and other outage events, and improves reliability which  
4 may save the customer money and improve satisfaction. Chart 4 graphically depicts the  
5 highlights from the analysis discussed above.

**Chart 4**



6 By maintaining a cycle with Integrated Vegetation Management (“IVM”)<sup>4</sup> techniques,  
7 the Company can best control current and future costs of system operation.

#### 9 **VI. HISTORIC SPEND AND CURRENT REQUEST**

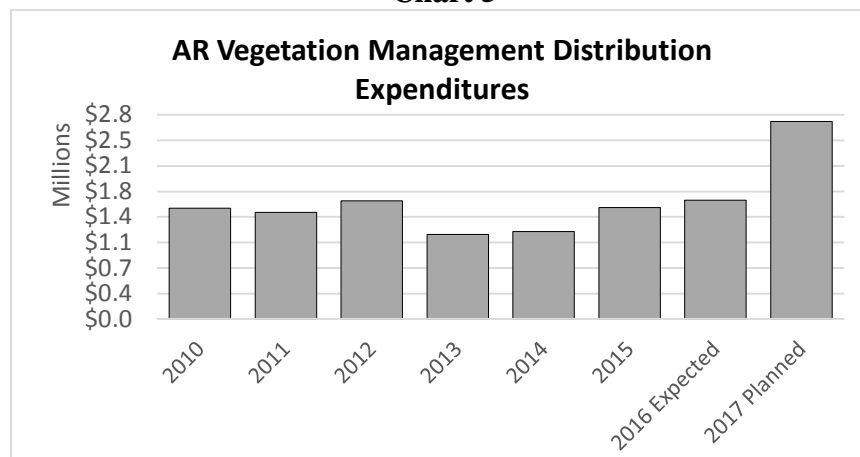
10 **Q. What has OG&E historically spent on distribution vegetation management work?**

11 **A.** Since 2010, OG&E has invested approximately \$1.42 million per year on average.  
12 During the test year, the Company spent approximately \$1.58 million. Chart 5 below  
13 details OG&E’s historic spend.

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<sup>4</sup> IVM is a best management practice defined in ANSI A300 part 7 as a system by which managing plant communities set objectives, identify vegetation, consider action thresholds, evaluate, select and implement control methods to meet objectives. The control methods selected are done so with respect to environmental impact, anticipated effectiveness, site characteristics, security, economics, and current land use.

Chart 5



Q. Does OG&E's request include vegetation management activities other than the 4 year distribution cycle work?

A. Yes. Reactive expenditures (non-cycle vegetation management) and substation ground maintenance are included in this request.

Q. What is the Company requesting to further the goal of a 4 year distribution cycle and continue to manage all non-cycle and substation vegetation management work?

A. The Company requests a *pro forma* adjustment of approximately \$1.08 million to fund all overhead and substation vegetation management work on the distribution system.

Q. What is the Company requesting to fund transmission vegetation management work?

A. The Company is requesting a *pro forma* adjustment of approximately \$84,000.

## VII. CONCLUSION

Q. What is OG&E requesting in this case?

A. OG&E is requesting a *pro forma* adjustment of approximately \$1.16 million to facilitate all transmission and distribution vegetation management work, thereby increasing safety and reliability in the Arkansas jurisdiction.

Q. Does this conclude your direct testimony?

A. Yes.