

BEFORE THE CORPORATION COMMISSION OF THE STATE OF OKLAHOMA COURT CLERK'S OFFICE - OKC CORPORATION COMMISSION OF OKLAHOMA

APPLICATION OF OKLAHOMA GAS AND ELECTRIC COMPANY FOR AN ORDER OF THE COMMISSION GRANTING THE RECOVERY OF COSTS ASSOCIATED WITH ITS SYSTEM HARDENING PROGRAM AND AUTHORIZING A RECOVERY RIDER	) ))))))	CAUSE NO. PUD 200800387
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### **RESPONSIVE TESTIMONY**

OF

**JAMES L. JONES** 

March 6, 2009

### CAUSE NO. PUD 200800387

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1		INTRODUCTION
2	Q:	Please state your name, by whom you are employed, in what capacity, and
3		your business address.
4	A:	My name is James L. Jones. I am employed as a coordinator in the Economic
5		Analysis and Research Group in the Public Utility Division (PUD) of the
6		Oklahoma Corporation Commission (OCC or Commission). My business address
7		is the Jim Thorpe Office Building, Room 580, 2101 N. Lincoln Boulevard,
8		Oklahoma City, Oklahoma 73105.
9		
10	Q:	How long have you been employed by the OCC?
11	A:	I have been employed by the OCC in the Public Utility Division since November
12		2007.
13		
14	0:	Please summarize your educational background and professional experience.
15	Δ.	L have a hasheler of gaiones degree in hydroge administration with a major in
13	A:	I have a bachelor of science degree in business administration with a major in
16		marketing from the University of Central Oklahoma in Edmond, Oklahoma. I
17		was employed by SBC for more than 32 years. Most of those years were spent
18		working in the regulatory, public affairs, and marketing organizations. Please see
19		the attached curriculum vitae for additional information (Exhibit JJ – 1).

# 1 Q: What are your present duties?

2	A:	As a member of the PUD's Economic Analysis and Research Group, my
3		responsibilities include research and analysis of energy-related matters typically
4		associated with electric and gas utilities. I am responsible for analyzing and
5		reviewing various areas of these utilities' operations. I am also responsible for
6		preparing recommendations and testimony on behalf of the PUD Staff.
7		
8	Q:	Have you previously testified before this Commission, and has this
9		Commission accepted your qualifications?
10	A:	Yes, I have previously testified before this Commission, and my credentials have
11		been accepted.
12		
13		PURPOSE OF TESTIMONY
13 14	Q:	PURPOSE OF TESTIMONY Please describe the instant Cause.
13 14 15	<b>Q:</b> A:	PURPOSE OF TESTIMONY Please describe the instant Cause. The instant Cause is a request for an order of the Commission which would grant
13 14 15 16	<b>Q:</b> A:	PURPOSE OF TESTIMONY         Please describe the instant Cause.         The instant Cause is a request for an order of the Commission which would grant         Oklahoma Gas and Electric Company (OG&E or Company) the ability to recover
13 14 15 16 17	<b>Q:</b> A:	PURPOSE OF TESTIMONY         Please describe the instant Cause.         The instant Cause is a request for an order of the Commission which would grant         Oklahoma Gas and Electric Company (OG&E or Company) the ability to recover         costs associated with the implementation of its proposed "System Hardening
<ol> <li>13</li> <li>14</li> <li>15</li> <li>16</li> <li>17</li> <li>18</li> </ol>	<b>Q:</b> A:	PURPOSE OF TESTIMONY Please describe the instant Cause. The instant Cause is a request for an order of the Commission which would grant Oklahoma Gas and Electric Company (OG&E or Company) the ability to recover costs associated with the implementation of its proposed "System Hardening Program."
<ol> <li>13</li> <li>14</li> <li>15</li> <li>16</li> <li>17</li> <li>18</li> <li>19</li> </ol>	<b>Q:</b> A:	PURPOSE OF TESTIMONY Please describe the instant Cause. The instant Cause is a request for an order of the Commission which would grant Oklahoma Gas and Electric Company (OG&E or Company) the ability to recover costs associated with the implementation of its proposed "System Hardening Program."
<ol> <li>13</li> <li>14</li> <li>15</li> <li>16</li> <li>17</li> <li>18</li> <li>19</li> <li>20</li> </ol>	<b>Q:</b> A: <b>Q:</b>	PURPOSE OF TESTIMONY         Please describe the instant Cause.         The instant Cause is a request for an order of the Commission which would grant         Oklahoma Gas and Electric Company (OG&E or Company) the ability to recover         costs associated with the implementation of its proposed "System Hardening         Program."
<ol> <li>13</li> <li>14</li> <li>15</li> <li>16</li> <li>17</li> <li>18</li> <li>19</li> <li>20</li> <li>21</li> </ol>	<b>Q:</b> A: <b>Q:</b> A:	PURPOSE OF TESTIMONY         Please describe the instant Cause.         The instant Cause is a request for an order of the Commission which would grant         Oklahoma Gas and Electric Company (OG&E or Company) the ability to recover         costs associated with the implementation of its proposed "System Hardening         Program."         What is the purpose of your testimony in this Cause?         The purpose of my testimony is to discuss and support Staff's recommendations

#### SUMMARY

Vegetation management is a crucial element in improving network 2 3 reliability and thus further hardening the electric grid against severe storm 4 damage and the customer outages which result from such damage. Staff 5 recommends the adoption of most of the "aggressive vegetation management" 6 element included in OG&E's System Hardening Program. The first phase of the 7 aggressive vegetation management element would have OG&E achieve a four-8 year vegetation management cycle, which is estimated by OG&E to cost 9 \$10,200,000 over the years 2009, 2010 and 2011. Staff also recommends the 10 adoption of the second phase of the aggressive vegetation management plan with 11 the exception of the proposed 3.25-year trim cycle. This second phase of 12 aggressive vegetation management has an estimated cost of \$10,200,000 annually 13 including the shortened trim cycle. This phase also includes the removal of larger 14 trees, the widening of needed clearance areas and the removal of overhanging 15 vegetation, all of which may significantly improve network reliability against 16 damage resulting from wind and ice

As a practical matter, Staff supports OG&E's circuit-hardening proposal. However, Staff recommends that engineering design studies be completed and specific circuit-hardening costs be identified, for a limited number of circuits or OG&E's initial group of circuits to be hardened and that Staff be given an opportunity to review these studies and costs prior to implementing the proposed circuit-hardening activities associated with OG&E's System Hardening Program.

1		Staff supports the breakaway connector pilot program outlined in OG&E's
2		network hardening proposal because more data is needed on the long-term
3		performance of these devices to determine their effectiveness on a broad scale.
4		Staff also supports OG&E's proposal for a pilot program to convert overhead
5		service drops to underground lines as a means to gain valuable data to determine
6		the better method of protecting service drops.
7		Staff supports the use of a rider to recover the costs associated with
8		OG&E's proposed System Hardening Program. Staff recommends a rider with
9		two caps; one cap for the recovery of the aggressive vegetation management
10		expenses, and a separate cap associated with the recovery of the carrying charges
11		associated with the two pilot programs.
12		
13		STAFF'S ANALYSIS
14	Q:	Have you reviewed the Company's proposed System Hardening Program?
15	A:	Yes, I have.
16		
17	Q:	Would you please explain what is meant by the term "hardening" as it
18		relates to a public electric utility's network?
19	A:	Yes. The term "hardening" is used to describe the activities associated with
20		improving the reliability of the electric grid or strengthening the electric network
21		against outages in general, but particularly outages caused by severe weather

1		conditions, such as wind and ice. Vegetation management and the
2		undergrounding of conductors are just two examples of hardening activities.
3		
4	Q:	Would you briefly describe the major elements of OG&E's System
5		Hardening Program?
6	A:	Yes. The program proposed by OG&E consists of four primary components, as
7		follows:
8		• Five levels of circuit-hardening;
9		Aggressive vegetation management;
10		• Pilot program for breakaway connectors; and
11		• Pilot program for undergrounding service drop lines.
12		
13	Q:	Please explain the Company's "five levels of circuit-hardening."
14	A:	OG&E's system hardening program proposes to harden electrical circuits using
15		five different levels of circuit-hardening activities. This element of the proposal
16		is to be completed over a six-year period, between 2009 and 2014. These five
17		levels are as follows:
18		• Level 1 – bringing the circuit to current minimum standards;
19		• Level 2 – strengthen support structures;
20		• Level 3 – replace small-gauge conductor;
21		• Level 4 – upgrade older network to grade B construction; and
22		• Level 5 – underground overhead lateral distribution facilities.

1		See Exhibit $JJ - 2$ for a further explanation of each of the five levels of circuit-
2		hardening and OG&E's estimated expenditure for each level over the six-year
3		life of the program.
4		
5	Q:	Please explain OG&E'S System Hardening Program component "aggressive
6		vegetation management."
7	A:	OG&E's System Hardening Program proposes a two-phased aggressive
8		vegetation management plan. The first phase, which is to be completed by 2011,
9		is to achieve a four-year vegetation management cycle as required by Oklahoma
10		Administrative Code (OAC) 165:35-25-15(c).
11		
12		The second phase of OG&E's aggressive vegetation management plan would
13		begin in 2009 and is an ongoing plan; i.e., it has no scheduled end date. This
14		phase of the plan has multiple elements which are as follows:
15		• Establishment of a 3.25-year vegetation management trim cycle;
16		• Removal of volunteer trees up to eight inches in diameter at breast height,
17		which are in the utility easement;
18		• Use of a foliar herbicide program for rural distribution easements;
19		• Create an additional four-foot clearance associated with the right-of-way in
20		certain areas; and
21		• Remove large overhanging vegetation during the vegetation management
22		trim cycle.
23		

Oklahoma Gas and Electric Cause No. PUD 200800387 Responsive Testimony of James L. Jones

#### 1 Q: Please explain OG&E's proposed pilot program for breakaway connectors.

This portion of the system-hardening program involves the placement of 500 2 A: breakaway connectors, also known as service entrance disconnect systems, across 3 OG&E's service territory. OG&E proposes to place 100 breakaway connectors in 4 each of its five districts to evaluate connector performance and determine their 5 applicability on a more widespread basis. The benefit of utilizing these units 6 occurs when a sizable tree limb or a tree falls on the customer's service drop line, 7 8 and the breakaway connector prevents the electrical equipment on the customer's 9 home or business, the mast and meter, from being ripped away from the structure. 10 The drop line simply unplugs from the connector located on the serving pole 11 and—assuming that is the only cause of the outage—then the drop can be "replugged" and the customer is back in service. When the mast and meter are 12 torn from the structure, a licensed electrician is required to re-install the 13 14 equipment before the utility can reconnect service. In the case of a major storm, 15 like the ice storm of December 2007, this can potentially cause a significant delay 16 in the customer having their service restored.

17

# 18 Q: Would you please explain OG&E's proposed pilot program for converting 19 overhead customer service drops to underground lines?

A: Much like the pilot program for breakaway connectors, with this pilot OG&E
 proposes to convert 100 overhead service drops to underground lines in each of its
 five districts. This pilot along with the breakaway connector pilot will permit

1 OG&E to evaluate the potential impact performance and the more cost effective 2 way to protect service drops during severe weather conditions.

What steps were taken by Staff to review and to consider the impacts of

- 3
- 4
- 5

**Q**:

# OG&E's System Hardening Program?

Staff met with OG&E officials and its consultant on multiple occasions during the 6 A: 7 development of its System Hardening Program. Discussions were held with OG&E before and after the filing of its Application. Staff also reviewed the input 8 9 and recommendations contained in the Oklahoma Corporation Commission's 10 Inquiry into Undergrounding Electric Facilities in the State of Oklahoma, dated 11 June 30, 2008. The Staff, along with OG&E officials toured areas of Oklahoma 12 City and discussed elements of the proposed program and saw first hand the 13 activities associated with the aggressive vegetation management plan, circuit-14 hardening and the breakaway connector pilot program.

- 15
- 16

### RECOMMENDATION

# 17 Q: Specifically, what is Staff recommendation regarding OG&E's System 18 Hardening Program?

A: Staff regards vegetation management as a key component in improving network
 reliability and thus further hardening the electric grid against severe storm
 damage and the customer outages which result from such damage. Staff
 recommends the adoption of most of the aggressive vegetation management

1 element of the OG&E System Hardening Program. The first phase of this element would have OG&E achieve a four-year vegetation management cycle as 2 required by OAC 165:35-25-15(c). For various reasons, OG&E has never 3 4 achieved a four-year trim cycle as required by this rule. OG&E explains in its 5 response to question two in Data Request OG&E PUD-JJ1, "When the rule 6 became effective in July, 2004, OG&E was not on a 4-year cycle and immediately 7 restructured its contracts with third-party vegetation management contractors to meet the 4-year cycle." However, for various reasons, including significant 8 9 weather events in 2007 and the lack of third party vegetation management contractors, OG&E has been unable to meet the requirement of OAC 165:35-25-10 11 15(c). OG&E has increased its vegetation management expenditures during the 12 last couple of years in an effort to meet the rule's requirement, but at the current 13 rate of progress OG&E still projects that the four-year trim cycle will not be met until 2013. 14

15

The four-year cycle catch-up proposal is estimated by OG&E to cost \$10,200,000 over the years 2009, 2010 and 2011. This increase in expenditures would permit OG&E to achieve the four-year trim cycle approximately two years sooner than currently projected; therefore, it is Staff's recommendation that this first phase of the aggressive vegetation management plan be adopted.

21

Staff also recommends the adoption of the second phase of the aggressive
 vegetation management plan with the exception of the proposed 3.25-year trim

1		cycle. This second phase of the aggressive vegetation management plan is
2		estimated to cost approximately \$10,200,000 per year for as long as the plan is in
3		place. OG&E estimates the second phase expenditures as follows:
4		
5		• \$2,800,000 - establishment of a 3.25-year vegetation management trim cycle;
6		• \$4,100,000 - removal of volunteer trees up to eight inches in diameter at
7		breast height, which are in the utility easement;
8		• \$1,000,000 – configure removal crews to remove large trees;
9		• \$1,200,000 - use of a foliar herbicide program for rural distribution easements;
10		• \$ 800,000 - create an additional four-foot clearance associated with the right-
11		of-way in certain areas; and
12		• \$ 300,000 - remove large overhanging vegetation during the trim cycle.
13		
14	Q:	Why does Staff's recommendation not include the 3.25-year vegetation
15		management cycle?
16	A:	Staff considers the achievement of a four-year trim cycle as a significant
17		improvement in OG&E's network reliability. Staff recommends foregoing an
18		attempt to establish a 3.25-year vegetation management cycle and its estimated
19		cost of \$2,800,000 annually, until 1) a four-year cycle can be achieved and
20		maintained, and 2) until outage data associated with a four-year cycle indicates
21		that a further shortening of the trim cycle would have a significant impact on
22		future outages.
23		

# Q: Does Staff recommend the adoption of the remaining portions of the second phase of the aggressive vegetation management element?

- A: Yes, Staff recommends the remaining portions of the aggressive vegetation management element be implemented. At an estimated cost of \$7,400,000 annually, the additional fortification afforded the network by removing larger trees, widening needed clearance areas and removing overhanging vegetation has the potential to significantly improve network reliability against damage resulting from wind and ice.
- 9

# 10 Q: What is Staff's recommendation regarding OG&E's proposed circuit11 hardening plans?

12 It is unclear to Staff exactly what impact that the circuit-hardening plans A: 13 contained in OG&E's System Hardening Program will truly have on improving 14 network reliability. Staff agrees that the "five levels of circuit-hardening" will 15 undoubtedly improve network reliability to some extent. This is displayed in Mr. Deric's Exhibit MD-2 where he estimates the "outage probability improvement" 16 17 and the "improvement in circuit restoration time" that the circuit-hardening 18 activities will produce. Mr. Deric's estimated "outage improvements" and "improvements in circuit restoration time" are as follows: 19

20

### 21 Circuit Outage Improvement

- Level 1 15% bringing the circuit to current minimum standards;
- Level 2 30% strengthen support structures;

1	• Level 3 – 40% – replace small-gauge conductor;
2	• Level $4 - 60\%$ – upgrade older network to grade B construction; and
3	• Level 5 – 90% – underground overhead lateral distribution facilities.
4	
5	Circuit Restoration Improvement
6	• Level $1 - 10\%$ – bringing the circuit to current minimum standards;
7	• Level 2 – 20% – strengthen support structures;
8	• Level 3 – 25% – replace small-gauge conductor;
9	• Level $4 - 50\%$ – upgrade older network to grade B construction; and
10	• Level 5 – 100% – underground overhead lateral distribution facilities.
11	
12	These projected circuit improvements are significant, especially for Levels 4 and
13	5; however, based upon the cost data provided by OG&E, it is difficult if not
14	impossible to derive the actual level of benefit or increased reliability from
15	spending an estimated \$115,000,000 on the circuit-hardening activities outlined ir
16	the proposal. Staff believes that the completion of additional engineering studies
17	identifying the specific or actual costs of circuit-hardening are warranted
18	especially since the current estimated cost of the programs is so significant
19	These studies would greatly assist Staff in formulating a recommendation in
20	support of this element of OG&E's System Hardening Program.

# 1Q:Is it Staff's recommendation that OG&E complete these additional2engineering studies for all circuits impacted before moving forward with the3System Hardening Program?

A: No. Staff understands that as a part of the circuit-hardening program that the 4 5 engineering design studies will be completed for each circuit affected prior to the 6 actual hardening activities being conducted on an individual circuit. These 7 studies will be completed over the six-year period as the proposed circuit-8 hardening activities progress. Staff recommends that these studies be completed 9 for a limited number of circuits or OG&E's initial group of circuits to be hardened 10 and that Staff be given an opportunity to review these studies and the associated 11 costs prior to OG&E implementing this portion of its System Hardening Program.

12

# Q: What is Staff's recommendation regarding OG&E's two proposed pilots programs?

15 Staff supports the two pilot programs outlined in OG&E's network hardening A: 16 proposal. The Public Utility Division Staff had recommended just such a 17 program as a part of the Oklahoma Corporation Commission's Inquiry into Undergrounding Electric Facilities in the State of Oklahoma. Staff believes the 18 19 "quick disconnect" devices could be a reasonable alternative to burying service 20 drop lines in strategic locations; however, they need some practical evidence before being deployed on a widespread basis. The use of breakaway connectors 21 22 could significantly impact network reliability, and potentially reduce customer 23 expenses associated with the replacement of the electrical mast and meter when service drop lines are damaged. However, not enough data is available on the
long-term performance of these devices to determine their effectiveness on a
broad scale. The breakaway connector pilot program is a good opportunity to
determine how these devices will hold up in Oklahoma's changing weather
conditions. Staff supports this pilot and would like to see OG&E move forward
with the deployment of the 500 connectors as outline in their proposal.

7

8 Staff also, supports OG&E's proposal to convert overhead service drops to 9 underground lines. Obviously, this is a more expensive solution to protecting 10 service drop lines from storm damage than the breakaway connectors. This pilot 11 will also provide valuable data to determine the better method of protecting 12 service drops. Staff would also like to see OG&E move forward with converting 13 the 500 service drops as outline in its proposal, but do so in a manner that would 14 permit a comparison of the data gathered from both the undergrounding and 15 breakaway connector pilots.

16

### 17 Q: What is the estimated cost of these two pilot programs?

A: OG&E estimates the cost of the breakaway connector pilot to be \$200,000, all to
be spent in 2009. OG&E estimates the cost of installing a single breakaway
connector to be \$400 of which, \$200 is the material cost and \$200 is labor cost.

21

The conversion of overhead service drops to underground lines is estimated to cost \$500,000 in 2009 and \$750,000 in 2010. The cost per service drop is

1		estimated to be \$2500 of which, \$190 is material, \$1,750 is labor, and \$560 is the
2		cost for a licensed electrician to convert the existing meter base to accept
3		underground service.
4		
5	Q:	What is Staff's recommendation regarding OG&E's proposal to employ a
6		rider for the recovery of the costs associated with the System Hardening
7		Program?
8	A:	Staff supports the use of a rider to recover the cost associated with OG&E's
9		proposed System Hardening Program; however, the rider should have multiple
10		caps. Staff recommends the rider have a cap associated with the recovery of
11		aggressive vegetation management expenses and a separate cap associated with
12		the recovery of the carrying charges associated with the two pilot programs.
13		
14		The aggressive vegetation management rider should be capped at \$8,600,000 in
15		2009, \$12,500,000 in 2010, \$9,000,000 in 2011 and \$7,400,000 for each year
16		thereafter and remain at that level until further action of the Commission. This
17		will give OG&E the opportunity to recover the estimated expenses associated
18		with the proposed aggressive vegetation management program less the proposed
19		3.25 year trim cycle. The rider for the two pilot programs should be capped at
20		\$205,000 per year to allow for the recovery of the carrying charges on the total

capital investment of approximately \$1,450,000 for the two programs. The two
pilot programs will provide valuable data in determining the more cost effective
way to protect service drop lines.

1		Additionally, OG&E should be required to submit to the PUD a tariff, much like
2		that attached to Mr. Walkingstick's testimony, containing detailed language and
3		rate information for the rider outlined above. The tariff would become effective
4		upon the approval by the director of the PUD.
5		
6		CUSTOMER IMPACT
7	Q:	How will the costs associated with OG&E's System Hardening Program be
8		recovered?
9	A:	OG&E's proposal only impacts the distribution portion of its electric grid;
10		therefore, only customers served directly from distribution facilities will be
11		affected by OG&E's System Hardening Program. Generally speaking, only
12		residential, small business and commercial customers will be impacted by the
13		proposed program. Large industrial customers typically served directly from
14		OG&E's transmission facilities will not be impacted by this proposal. Likewise,
15		only distribution customers will be financially impacted by this proposal.
16		
17		OG&E proposes to recover the cost associated with the System Hardening
18		Program through the establishment of a rider. Staff supports this recommendation
19		since this approach would more easily permit potential adjustments to be made
20		than if costs were recovered in base rates. Staff and OG&E agree that this plan
21		will necessitate some sort of monitoring program. This program must include the
22		reporting and evaluating of expenditures prior to recovery of such expenditures

1		from customers. Staff proposes that reports be submitted at least annually, but or
2		no more often than every four months. This process is yet to be worked out
3		among the parties.
4		
5	Q:	What is the billing impact of OG&E's System Hardening Program on
6		distribution customers?
7	A:	If the entire System Hardening Program were adopted, OG&E estimates that the
8		financial impact on distribution customers would be \$1.26 per month in year one
9		(2009) and increasing to \$1.78 per month in year six (2014). Based upon Staff's
10		recommendation to adopt most of the aggressive vegetation management plan and
11		implement the two pilot programs, the estimated impact on customers would be
12		\$1.14 per month in year one (2009) and decreasing to \$0.50 per month in year
13		four (2012), which is calculated by using the projected expenditures provided in
14		OG&E's application.
15		
16		
17	I state	under penalty of perjury under the laws of Oklahoma that the foregoing is true and
18	correc	.t.
19		
20	Marc	h 6, 2009, Oklahoma City, OK
21		(Date and Place) (Signature)



James L. Jones

Curriculum Vitae Of James L. Jones

Mr. Jones is a Coordinator of Economic Analysis & Research with the Oklahoma Corporation Commission. He has over thirty years of utility regulatory experience. Additionally, he has organizational development skills and technical communication experience.

### **Professional Experience**

### SBC – District Manager Rates

- Developed and managed SBC's interstate and intrastate Switched Access Tariffs.
- Represented SBC's Switched Access Tariffs before the Federal Communications Commission and state regulatory agencies.
- Coordinated the preparation and filing of SBC's Annual Interstate Access Tariff Filing.

### SBC – Director Access Product Management

- Responsible for SBC's interstate and intrastate Switched Access rates and revenues.
- Responsible for SBC's switched unbundled network elements.
- Restructured SBC's Switched Access common and dedicated transport services.
- Lead SBC's wireless interconnection negotiation team.

### SBC - Executive Director - External Affairs

- Responsible for the administration of SBC-Oklahoma's intrastate rates and tariffs.
- Responsible for representing SBC-Oklahoma before the Oklahoma Corporation Commission.

Coordinator of Economic Analysis & Research **Oklahoma Corporation Commission** 580 Jim Thorpe Building P.O. Box 52000 Oklahoma City, OK 73152 Tel: 405-522-5192 Fax: 405-521-3336 j.jones@occemail.com

### **Professional History**

• SBC–District Manager Rates

• SBC– Director Access Product Management

• SBC – Executive Director–External Affairs

• Beacon Telecommunications Advisors–Manager Regulatory

 OCC–Public Utility Regulatory Analyst • OCC – Coordinator Economic Analysis & Research

### **Education**

 B.S., Marketing, College of Business Administration, University of Central Oklahoma

### Beacon Telecommunications Advisors – Manager Regulatory

• Represented independent local exchange carriers on telecommunications regulatory issues in industry forums and before the Missouri Public Service Commission.

### **OCC – Public Utility Regulatory Analyst**

- Responsible for issues in assigned causes concerning energy related matters associated with electric and gas utilities.
- Responsible for the development and support of expert witness testimony involving assigned areas of responsibility.
- Lead the research and analysis of the Oklahoma Corporation Commission's inquiry into undergrounding electric facilities in the state of Oklahoma.

### OCC - Coordinator - Economic Analysis & Research

- Responsible for analyzing, reviewing and the preparation of recommendations involving the operations of electric and gas utilities.
- Responsible for the development and support of expert witness testimony involving assigned areas of responsibility.

### **Professional Training**

- New Mexico State University, Utility Rate School.
- Electric Utility Accounting

#### FIVE LEVELS OF CIRCUIT-HARDENING

- The <u>first level</u> of hardening would bring older circuits up to the standards currently in place. For example, OG&E would replace wood pin arms with steel pin arms with wood braces, replace single phase cross arms with pole top pins (use T-brackets on transformer poles) and replace open-wire service drops with twisted cable. (OG&E estimated expenditure = \$271,276 / 2009 through 2014)
- The <u>second level</u> of hardening activity is the strengthening of support structures. Such strengthening would entail upgrading marginal poles, adding or increasing the number of guys and anchors for cascade prevention, and replacing all strap braces with wood braces. (OG&E estimated expenditure = \$10,456,541 / 2009 through 2014)
- The <u>third level</u> of hardening activity involves replacing small wire conductors, *i.e.*, replacing all steel and copper wire primary with ACSR (aluminum w/steel core) and replacing open wire secondary copper with either SAC (secondary aerial cable) in non-accessible, heavily wooded areas or with open-wire ACSR where practical. It is important to note that the second and third levels of circuit-hardening not only involve hardening at that particular level, but also the performance of lower level hardening as well. (OG&E estimated expenditure = \$2,725,402 / 2009 through 2014)
- The <u>fourth level</u> of hardening involves upgrading the entire circuit to grade B construction requirements. The grade B standard provides for higher wind loading of the facilities, which provides facilities with greater tolerance for higher wind speeds and

ice loading than current grade C construction. (OG&E estimated expenditure = \$91,730,856 / 2009 through 2014)

 The <u>fifth level</u> of hardening involves the undergrounding of currently overhead lines, *i.e.*, relocating all lateral overhead lines on certain identified circuits (including service lines) underground and bringing the circuit backbone section to grade B construction standard. (OG&E estimated expenditure = \$8,550,146 / 2009 through 2014)

#### CERTIFICATE OF SERVICE

I, the undersigned, do hereby certify that on the  $6^{th}$  day of March, 2009, a true and correct copy of the above and foregoing was deposited, with postage prepaid thereon, in the U.S. Mail to:

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