

**BEFORE THE STATE CORPORATION COMMISSION
OF THE STATE OF KANSAS**

DIRECT TESTIMONY OF

RICHARD A. SPRING

ON BEHALF OF

KANSAS CITY POWER & LIGHT COMPANY

**IN THE MATTER OF THE APPLICATION OF
KANSAS CITY POWER & LIGHT COMPANY
TO MODIFY ITS TARIFFS TO CONTINUE THE
IMPLEMENTATION OF ITS REGULATORY PLAN**

DOCKET NO. 07-KCPE-_____-RTS

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

2 A: My name is Richard A. Spring. My business address is 1201 Walnut, Kansas City,
3 Missouri 64106-2124.

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

5 A: I am employed by Kansas City Power & Light Company (“KCPL”) as Vice President,
6 Transmission Services.

7 **Q: What are your responsibilities?**

8 A: My responsibilities include overseeing KCPL’s transmission planning, transmission
9 system operations, energy management system (“EMS”), distribution outage
10 management system (“OMS”), substation & transmission engineering, transmission

1 construction & maintenance, substation construction & maintenance, and system
2 protection.

3 **Q: Please describe your education, experience and employment history.**

4 A: I hold a Master of Business Administration from Rockhurst College, a Bachelor of
5 Science in Mechanical Engineering from Wichita State University and an Associates of
6 Arts degree from Butler County Community College. I began my career at Kansas City
7 Power & Light (“KCPL”) in 1978 as a Staff Maintenance Engineer, promoted to
8 Operations Supervisor in 1979, Maintenance Superintendent 1982, all at the La Cygne
9 Generating Station. I then moved to the Iatan Generating Station as Maintenance
10 Superintendent where I was promoted to Plant Manager in 1984. I transferred to
11 Manager Performance Programs in 1988. I returned to the La Cygne Generating Station
12 in 1991 as Plant Manager. In 1993, I joined Northern Indiana Public Service Company
13 as Director of Electric Production. I returned to KCPL in 1994 as Vice President,
14 Production. I shifted responsibilities and was named Vice President Transmission and
15 Environmental Services in 1999. In 2003 I was named to my current position of Vice
16 President Transmission Services.

17 **Q: Please describe your involvement with the Southwest Power Pool.**

18 A: I am currently the Chair of the Southwest Power Pool (“SPP”) Strategic Planning
19 Committee, a member of the SPP Members Committee, and a member of the SPP Human
20 Resources Committee. Previously, I served as a Director on the SPP Board of Directors
21 prior to the evolution to the current independent Board of Directors.

1 **Q: Have you previously testified in a proceeding at the Kansas Corporation**
2 **Commission or before any other utility regulatory agency?**

3 A: I have previously testified before both the Kansas Corporation Commission (“KCC”) and
4 the Missouri Public Service Commission (“MPSC”).

5 **Q: What is the purpose of your testimony?**

6 A: The purpose of my testimony is to summarize the goals and objectives of KCPL’s Asset
7 Management Plan (or the “Plan”) for KCPL’s transmission and substation assets. I will
8 provide an update detailing what steps have been implemented within the Plan and
9 discuss some specific elements including capital budget requirements to support the Plan.
10 I will also explain KCPL’s membership commitments to SPP.

11 **Q: What are the goals and objectives of the Plan for the transmission and substation**
12 **areas?**

13 A: Asset Management at KCPL is the structured and disciplined process to develop the
14 program of work for system expansion, system improvements, and maintenance (both
15 corrective and preventive). For KCPL’s transmission and substation assets, our objective
16 is to provide a scope of work that achieves four key strategic goals while at the same time
17 optimizing costs: (i) Minimize forced transmission line outages per hundred mile year
18 (“FOHMY”); (ii) Minimize the System Average Interruption Duration Index (“SAIDI”)
19 as it relates to the duration and frequency of outages to our customers; (iii) Maximize
20 transmission system availability; and (iv) Compliance with all requirements of the North
21 American Electric Reliability Corporation (“NERC”) and SPP reliability standards
22 governing the operation of the bulk-power system.

1 Through Asset Management, and as a result of implementing the Plan, we expect
2 to maintain Tier 1 service reliability levels to our customers while consistently optimizing
3 the operations, planning, construction and maintenance strategies of KCPL’s
4 transmission and substation assets. Details set forth within the Plan provide for vital
5 maintenance, inspection and testing programs of all major components addressing the
6 replacement of aging transmission and substation infrastructure.

7 I emphasize that our fourth strategic goal related to meeting bulk-power system
8 reliability criteria is critical in our strategy going forward. Due to the recent formation of
9 the Electric Reliability Organization (“ERO”) implemented by the Federal Energy
10 Regulatory Commission (“FERC”) as a result of the provisions of the 2005 Energy
11 Policy Act, KCPL must meet requirements of a growing set of bulk-power reliability
12 standards that are now mandatory and enforceable by FERC. Executing various key
13 strategic transmission and substation asset management plans will ensure that KCPL
14 fulfills each reliability standard and, therefore, remains compliant with the standards.

15 **Q: What are the specific elements of the Plan?**

16 **A:** KCPL’s Plan outlines key initiatives that will provide maximum benefits to meeting the
17 four strategic goals I outlined in the previous question. Each initiative and activity serves
18 to reach our goals while maximizing benefits and minimizing costs.

19 In some aspects, the transmission and distribution assets have common
20 maintenance requirements due to similar components such as wood pole structures,
21 insulators, exposed conductor wire, enclosed metal-clad switchgears, etc. Other elements
22 in the transmission system, such as relay protection equipment, large-scale substation
23 transformers and high voltage breakers require unique maintenance treatment. Each set

1 of transmission elements requires appropriate asset management treatments to maintain
2 critical operating functions, maximize life expectancy and to address asset obsolescence.
3 KCPL participates actively in a number of utility consortiums, utility forums and industry
4 research, such as the Electric Power Research Institute or EPRI and IEEE, as well as
5 utilizing historical maintenance records and operating experience to provide a foundation
6 for our transmission asset management practices. As a result, KCPL strategically designs
7 specific transmission and substation asset equipment inspections, maintenance plans and
8 schedules, equipment testing schedules and equipment end-of-life replacement schedules
9 based on the intelligence provided by these inputs.

10 **Q: What programs are to be funded under the Transmission portion of the Plan (the**
11 **“Transmission Plan”)?**

12 A: KCPL has designated funding proposed for the transmission and substation assets under
13 capital budget item BP01 – Transmission and Substations Asset Management Strategic
14 Intent Program. The proposed funding breakdown for each program is detailed in the
15 attached Schedule RAS-1.

16 **Q: What progress has been made thus far with respect to the Transmission Plan?**

17 A: The Transmission Plan includes nineteen transmission and substation projects and
18 programs. KCPL began fourteen of these projects in 2006. The remaining five are
19 scheduled to begin in years 2007-2010.

20 **Q: Could you please explain the various programs KCPL undertook in 2006 related to**
21 **Transmission and Substation Asset Management?**

22 A: Yes, KCPL undertook the following fourteen Transmission and Substation Asset
23 management programs in 2006:

1 **1) Distribution Breaker Replacements**

2 Distribution Feeder Breakers reaching the end of their life cycle will undergo a complete
3 rebuild with replacement of worn bearings and linkages, refurbishment or replacement of
4 trip and closing mechanisms and arc shoots. Currently, KCPL has approximately 180 GE
5 breakers with an average age of 37 years that consistently cause excessive unplanned
6 outages and increased maintenance costs. During 2006, a total of 36 distribution feeder
7 breakers were completed thereby fulfilling the planned work for the year.

8 **2) Remote Terminal Unit Replacements**

9 Obsolete Remote Terminal Units (“RTUs”) that provide remote monitoring and control
10 of substation and transmission line equipment will be replaced and spare parts will be
11 used for remaining units. KCPL currently has 37 obsolete RTUs for which spare parts
12 are no longer available. Purchase orders were issued to Telvent for three new RTUs, and
13 two of these RTUs were installed at the Kennilworth and Overland Park substations in
14 2006. The third RTU is in the process of being replaced at the Hickman substation.
15 KCPL anticipates that work will be completed in the first quarter of 2007.

16 **3) McGraw Edison PSD Breaker Replacements**

17 KCPL has a total of 36 12-kV distribution breakers manufactured by McGraw Edison
18 that are hydraulically operated and have a history of significantly decreased reliability
19 and increased maintenance cost over time. These breakers will be replaced with current
20 vacuum design type breakers. Twelve breakers were purchased and installed at the Barry
21 and Roeland Park substations. This completed the planned McGraw Edison breaker
22 replacement work for 2006.

1 **4) 34-kV and 69-kV Circuit Breaker Replacements**

2 KCPL has a number of 34-kV and 69-kV circuit breakers that are more than 50 years old
3 and have reached end of life. A system-wide assessment was made for existing breakers
4 at this voltage level, and a program developed to replace these beginning with the most
5 problematic breakers first. Two 69-kV breakers were purchased and replaced during
6 2006.

7 **5) Craig Substation 345-kV Circuit Breaker Replacements**

8 At KCPL's Craig substation, two 345-kV breakers have SF6 (sulfur-hexafluoride) gas
9 leaking issues rendering these breakers unreliable and costly to maintain. Costs to
10 rebuild these breakers were estimated to be as costly or more costly than complete
11 replacement. Installing new breakers eliminates the expense to consistently replace the
12 SF6 gas and mitigates the risk of breaker failure. These two 345-kV breakers at Craig
13 substation were replaced in 2006.

14 **6) Higginsville Pole Mounted Sectionalizing Switches Replacements**

15 KCPL has a number of 69-kV pole-mounted sectionalizing switches that are obsolete and
16 problematic. Due to their unreliability, we are experiencing excessive outage durations.
17 By replacing these 69-kV switches with new, more reliable switches, customer service
18 levels will be improved by reducing outage durations for customers fed from the affected
19 69-kV line sections. KCPL installed a replacement switch for Higginsville in the fourth
20 quarter of 2006.

21 **7) Corder Pole-Mounted Sectionalizing Switches Replacements**

22 KCPL has a number of 69-kV pole-mounted sectionalizing switches that are obsolete and
23 problematic. Due to their unreliability, we are experiencing excessive outage durations.

1 By replacing these 69-kV switches with new and reliable switches, customer service
2 levels will be improved by reducing outage durations for customers fed from the affected
3 69-kV line sections. A replacement switch for Corder was installed in fourth quarter
4 2006.

5 **8) Transmission Substation Disconnect Switch Replacements**

6 KCPL has a number of 161-kV transmission substation disconnect switches that are over
7 40 years old and have reached end of life. This program will replace the worst
8 performing switches. Two 161-kV disconnect switches have been replaced at
9 Greenwood substation, which completed the scheduled project work for 2006.

10 **9) Transmission Wood Pole Replacements**

11 KCPL has a comprehensive transmission pole and structure inspection and replacement
12 program that includes GPS location cataloging, inspection schedules, repair work and
13 replacements. The transmission pole replacement initiative includes accelerated
14 replacement of wood poles that are at end of life or are exhibiting an accelerated
15 deterioration rate. Transmission pole replacements ensure viable transmission
16 infrastructure for the future while mitigating risks of catastrophic failures and improving
17 customer service levels and transmission system availability. During 2006, thirty-three
18 transmission wood poles were replaced.

19 **10) 161-kV Transmission Wood Cross-Arm Replacements**

20 KCPL has a comprehensive transmission pole and structure inspection and replacement
21 program that includes GPS location cataloging, inspection schedules, repair work and
22 replacements. KCPL has identified 161-kV transmission wood cross-arms that are
23 between 30 and 54 years old and at end of life. The transmission wood cross-arm

1 initiative includes replacement of cross-arms that are at end of life or at an accelerated
2 deterioration rate. Transmission wood cross-arm replacements ensure viable
3 transmission infrastructure for the future while mitigating risks of catastrophic failures
4 and improving customer service levels and transmission system availability. During
5 2006, seven 161-kV cross-arms were replaced, which was less than the scheduled plan of
6 40 replacements. This reduction was primarily due to KCPL's release of contract crews
7 to provide mutual aid assistance for various storms affecting the transmission systems of
8 various surrounding utilities throughout the year.

9 **11) 345-kV Transmission Wood Cross-Arm Replacements**

10 KCPL has a comprehensive transmission pole and structure inspection and replacement
11 program that includes GPS location cataloging, inspection schedules, repair work and
12 replacements. KCPL has identified 345-kV transmission wood cross-arms that are over
13 35 years old and at end of life. The transmission wood cross-arm initiative includes
14 replacement of cross-arms that are at end of life or at an accelerated deterioration rate.
15 Transmission wood cross-arm replacements ensure viable transmission infrastructure for
16 the future while mitigating risks of catastrophic failures and improving customer service
17 levels and transmission system availability. During 2006, sixteen 345-kV cross-arms
18 were replaced.

19 **12) Hawthorn-Moberly – Structural Member Replacements**

20 A significant number of structural members in this 102-mile 161-kV line have reached
21 end of life or have accelerated deterioration and require replacement to avoid structural
22 failure. This project accelerates the replacement of the worst structure members. During
23 2006, forty-one structure arms were replaced.

1 **13) Montrose ABCD Transmission Lines Pole Top Replacement**

2 A significant number of structural members in these four 161-kV lines have reached end
3 of life or have accelerated deterioration and require replacement to avoid structural
4 failure. This project accelerates the replacement of the worst structure members. During
5 2006, thirty-eight structure arms were replaced.

6 **14) Galvanized Shield Wire Replacement**

7 KCPL has several lines that have shown increased shield wire failures due to their
8 40 year age, vibration fatigue, lightning damage, and corrosion. These failures cause
9 increased frequency of transmission line outages that impact customer service and
10 transmission line availability. This initiative identifies specific sections of shield wire to
11 be replaced to mitigate shield wire failures and improve customer service levels. During
12 2006, 3.35 miles of shield wire have been replaced compared with a plan for six miles of
13 replacement. Shield wire replacements were less than planned for the year due to
14 KCPL's release of contract crews to provide mutual aid assistance for various storms
15 affecting the transmission systems of various surrounding utilities throughout the year.

16 **Q: Have you requested an adjustment to the transmission and substation maintenance**
17 **expense?**

18 A: Yes.

19 **Q: Please explain the requested adjustment.**

20 A: KCPL is requesting increased funding for additional Transmission and Substation
21 initiatives that will enhance customer service levels, provide for improvements in
22 operations, planning and maintenance activities and facilitate meeting the mandatory
23 national and regional reliability standards. These transmission and substation

1 adjustments total approximately \$2.0 million above the 2006 test period and are shown in
2 Schedule RAS-2. This adjustment is a component of Adj-26b—“Normalize transmission
3 and distribution maintenance expense” on Schedule JPW-2, attached to the direct
4 testimony of KCPL witness John P. Weisensee.

5 **Q: What are the elements of the requested adjustment?**

6 **A:** The elements of the requested adjustment are summarized as follows:

7 **Transmission Operations Personnel and Software Systems**

8 KCPL manages and supports a full-time transmission system control center where system
9 operators and technical staff monitor, control, plan and coordinate transmission system
10 operations. Influencing this operation is a growing set of reliability standards instituted
11 by NERC and the SPP that will require additional support in order to maintain
12 compliance to the standards. KCPL plans to meet these additional responsibilities by
13 supplementing support staff to provide enhanced efforts in these areas and ensure that we
14 fulfill each reliability standard and remain compliant with the standards.

15 KCPL also manages and maintains two real-time computer systems that monitor,
16 control and support the generation, transmission and distribution systems. EMS and
17 OMS continue to expand in both scope of functionality and the need to integrate with
18 new technology. As we move forward with the objectives set forth in our Distribution
19 Automation strategy, these technology applications from the EMS and OMS systems
20 become more critical in developing viable technology solutions. We have identified
21 additional software and hardware systems necessary to support these goals. Total
22 funding for these transmission operations personnel and software systems initiatives is
23 \$510,000.

1 **Transmission and Substation Infrastructure Support**

2 KCPL has identified a number of transmission and substation infrastructure support
3 initiatives that require additional focus. These include: corrosion prevention for a
4 number of steel towers and structures, substation circuit switcher pole replacements and
5 control house repairs. Addressing these will maintain customer service levels by
6 mitigating catastrophic loss of equipment.

7 In the area of transmission vegetation management, KCPL has identified the
8 application of aerial lift equipment that will dramatically improve trimming efficiencies
9 and help to deploy trimming crews more effectively. This initiative serves to meet the
10 overall objectives within KCPL’s transmission vegetation management plan.

11 In the area of research, KCPL has consistently participated and helped fund
12 industry-wide research in a variety of areas that, in time, translates into real-world utility
13 solutions.

14 Facing a rising proportion of aging infrastructure within the industry, it is
15 imperative that the kinds of research we participate in not only continue but strengthen as
16 well. We plan to provide increased funding for additional research activities with the
17 expertise of EPRI and others in order to gain a collaborative set of solutions that will help
18 to meet our infrastructure management goals. Total funding for this transmission and
19 substation infrastructure support is \$1,065,000.

20 **Transmission Line Inspection**

21 KCPL’s plan is to accelerate the wood pole inspection schedule in order to return to
22 normal inspection cycles. Inspections provide critical information on deterioration rates

1 and are useful in determining end of life cycles. This in turn allows timely pole
2 replacements to mitigate pole failures.

3 Transmission anchors and ground wire inspections and replacements are also an
4 area of focus. KCPL continues to experience increased levels of vandalism and theft for
5 transmission ground wires that have increased the need for additional inspection efforts.
6 KCPL intends to increase funding for this initiative in order to mitigate accelerated
7 corrosion issues and vandalism events.

8 KCPL employs aerial inspection methods for transmission line assets that in turn
9 provide a non-invasive, systematic and efficient approach to inspection work. Due to the
10 expanding mileage of transmission line installed, we expect to increase and accelerate
11 aerial inspections to improve both the rate at which we can inspect as well as to mitigate
12 equipment failures.

13 Total funding for these transmission line inspection initiatives is \$415,000.

14 **Q: Are there other adjustment requests?**

15 A: Yes.

16 **Q: Please describe any additional adjustment requests?**

17 A: KCPL has two additional transmission adjustment requests.

- 18 ▪ Transmission base-plan funding obligations to SPP. These costs are detailed in
19 Schedule RAS-3.
- 20 ▪ Transmission funding obligations for NERC and SPP reliability compliance and
21 enforcement. These costs are also detailed in Schedule RAS-3.

1 These two adjustments totaling \$1,230,000 are included in Adj-48—“Adjust transmission
2 expense for expansion projects of SPP” included in Schedule JPW-2 attached to the
3 direct testimony of KCPL witness John P. Weisensee.

4 **Q: Please describe the SPP transmission base-plan funding adjustment.**

5 A: KCPL’s membership in SPP provides several benefits and obligations. KCPL, as a
6 transmission owner, has transferred functional control of its transmission facilities to the
7 SPP. This augments KCPL’s transmission operations and planning activities by allowing
8 the SPP to perform the following responsibilities:

- 9 ▪ The SPP Open Access Transmission Tariff provides transmission customers a
10 single transmission tariff for all KCPL transmission service purchased on our
11 system.
- 12 ▪ SPP acts as KCPL’s Reliability Coordinator and is responsible for coordinated
13 regional transmission operations to maintain bulk-power system reliability.
- 14 ▪ SPP acts as KCPL’s Planning Coordinator and performs regional planning
15 activities for all SPP members resulting in a comprehensive regional transmission
16 expansion plan. The expansion plan includes, among other things, proposed
17 transmission element additions and upgrades within the SPP region in order to
18 conform to applicable reliability requirements of the SPP, NERC and
19 transmission owners.

20 I would like to expand upon the last item relating to the SPP regional transmission
21 expansion plan. SPP’s expansion plan proposes regional transmission element additions
22 and includes a detailed list of projects in order to achieve the plan. A major portion of
23 the expansion plan includes those projects that are termed “base-plan upgrades,” which

1 are those transmission additions required to meet the mandatory NERC and SPP
2 reliability standards and criteria. Due to the nature of the interconnected transmission
3 system, these base-plan transmission additions produce indirect reliability benefits across
4 the SPP region. Therefore, SPP employs a cost allocation methodology to provide fair
5 and equitable sharing of costs for base-plan transmission additions. The SPP cost
6 allocation calls for one-third of the project cost to be shared by all SPP members, and the
7 remaining two-thirds of the project cost to be allocated among the members that directly
8 benefit from the project.

9 For the current SPP transmission expansion plan, KCPL has funding obligations
10 of approximately \$950,000 in 2007 for the region-shared, base-plan transmission
11 expansion additions. Because the SPP transmission expansion plan is a relatively new
12 process, there were no funding obligations required from KCPL in the 2006 year.

13 **Q: Please describe the NERC and SPP reliability compliance and enforcement**
14 **adjustment.**

15 A: As a result of the Energy Policy Act of 2005, the FERC has been given specific
16 responsibilities for the reliability of the bulk-power system. Also within the act,
17 Congress directed the formation of a new ERO and corresponding Reliability Entities
18 whereby bulk-power reliability enforcement and compliance activities would take place.
19 As a result, NERC and the Regional Entities - including SPP, are supplementing their
20 existing infrastructure to implement these reliability compliance and enforcement
21 responsibilities. In late 2006, NERC and SPP budgets were submitted for 2007
22 indicating an increase of \$230,000 for KCPL's portion of the NERC and SPP fees.

1 **Q: Please discuss KCPL's Transmission Performance in 2006.**

2 A: KCPL's transmission operational performance remains strong and is recognized in many
3 areas as an industry leader. For transmission performance measurement, KCPL has taken
4 a leadership role, along with EPRI, to develop the emerging transmission system metrics,
5 which promises to provide our industry with a comprehensive set of specific, clear
6 performance metrics. We took further strides in 2006 to become even more focused on
7 critical initiatives such as formalized asset management and improved efficiencies in
8 operations and maintenance, technology applications and reliability standards
9 compliance.

10 For 2006, KCPL measured the transmission system performance with the
11 following performance metrics:

- 12 ■ KCPL's FOHMY goal was 3.15, and 2006 year-end results were 2.496.
- 13 ■ KCPL's SAIDI goal was 5.0 minutes, and 2006 year-end results were
14 1.79 minutes. This represents the second lowest figure over the last six years,
15 making 2006 a near-record year for minimizing customer interruptions.
- 16 ■ KCPL's transmission and substation availability goal was 99.900%, and 2006
17 year-end results were 99.580%. This goal was not met largely because of a
18 catastrophic failure of a 345/161-kV autotransformer at our Stilwell substation
19 rendering it out of service for 81 days during the last quarter of the year. KCPL
20 has purchased a replacement, which is scheduled for installation in June of 2007.
- 21 ■ KCPL's goal for compliance with all NERC and SPP standards that apply to
22 transmission was 100%, and the 2006 year-end result was 94%. KCPL will
23 accelerate the upcoming 2007 schedule to resolve the delayed testing and remain

1 on track for this work in the future. KCPL has consistently been found to be
2 compliant with the reliability standards during all formal NERC and SPP audits.

3 ■ KCPL's goal for transmission outages resulting from vegetation contacts
4 remained at zero, and the 2006 year-end result was zero.

5 ■ KCPL's goal for the percentage of transmission line miles patrolled annually is
6 100%, and the 2006 year-end result was 100%.

7 ■ KCPL's goal for the percentage of transmission structures maintained annually is
8 3.88%, and the 2006 year-end result was 4.17%.

9 **Q: Does that conclude your testimony?**

10 A: Yes, it does.

