Exhibit No.:	
Issue:	Supply Plan Maintenance Expense Normalization
Witness:	F. Dana Crawford
Type of Exhibit:	Direct Testimony
Sponsoring Party:	Kansas City Power & Light Company
Case No.:	ER-2007-____
Date Testimony Prepared:	January 31, 2007

MISSOURI PUBLIC SERVICE COMMISSION

CASE NO. ER-2007-____

DIRECT TESTIMONY

OF

F. DANA CRAWFORD

ON BEHALF OF

KANSAS CITY POWER & LIGHT COMPANY

Kansas City, Missouri
January 2007

Certain Schedules Attached To This Testimony Designated ("HC")
Have Been Removed
Pursuant to 4 CSR 240-2.135.

DIRECT TESTIMONY

OF

F. DANA CRAWFORD

Case No. ER-2007-____

Q: Please state your name and business address.

A: My name is F. Dana Crawford. My business address is 1201 Walnut, Kansas City, Missouri 64106-2124.

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

A: I am employed by Kansas City Power & Light Company ("KCPL") as Vice President, Plant Operations.

Q: What are your responsibilities?

A: My responsibilities include the direction of the operation and maintenance of KCPL's fossil-fuel generating stations, including their support and construction services.

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

A: I graduated from the University of Missouri-Columbia with a degree in Civil Engineering. I also have a Master of Business Administration degree from DePaul University. I joined KCPL in 1977 as a Construction Engineer on the Wolf Creek Nuclear Plant project. In 1980, I was promoted to Manager, Nuclear and promoted to Director, Nuclear Power in 1983. Following completion of Wolf Creek, I became Manager, Distribution Construction & Maintenance, in 1988 and Manager, Customer Services, in 1989. In 1994, I became Plant Manager of the LaCygne Generating Station. I was promoted to my current position in March of 2005.

Q: Have you previously testified in a proceeding at the Missouri Public Service Commission ("MPSC") or before any other utility regulatory agency?

A: Yes, I testified before the MPSC in KCPL's rate case concerning the Wolf Creek Nuclear Generating Station. I also submitted testimony in KCPL's 2006 rate case in Case No. ER-2006-0314.

Q: What is the purpose of your testimony?

A: The purpose of my testimony is twofold. First, I will provide historical information concerning KCPL's plant operations and outline the steps KCPL needs to take to continue the successful operation of its generation facilities. Second, I will describe the normalization of maintenance expenditures included in this proceeding.

I. BUSINESS PLAN

Q: Please describe KCPL's historical operation of its generating units?

A: KCPL has had significant success in the operation of its generating units. The net generation produced by KCPL's existing coal fleet has increased significantly in recent years. During the past five years (both annually and in total), net megawatt-hour production from the coal units has reached the highest levels in KCPL's history. In other critical performance areas, the coal fleet's equivalent availability has also increased and the total production costs of the coal fleet have remained at the very lowest levels both regionally and nationally.

Q: What will be necessary for KCPL to continue this success?

A: There are two primary areas that will be critical. First, the continuing work force turnover must be effectively managed. The necessary workplace culture, management talent and technical skills must be provided to maintain and operate the existing and future generating assets at high levels of performance.

Secondly, ongoing performance improvements will be needed to continue to deliver increased levels of output from the existing aging generating assets while integrating the new environmental equipment into plant operations.

Q: Please describe the challenges that KCPL faces regarding the generating station workforce?

A: KCPL has a very experienced workforce for its generating stations, many of whom were hired at the time of construction of the units and are now nearing retirement age. In fact, within the next five years, over 32% of the fossil station management employees and almost 30% of the fossil station bargaining unit employees will be eligible for retirement. Approximately 20% more of the employees in both groups will be eligible for retirement within ten years. Because of the potential retirements of so many experienced employees, KCPL will have significant ongoing recruitment, hiring and training efforts for the needed replacement employees. In addition, KCPL will incur not only the increased costs of "on-boarding" large numbers of new employees, but also the costs to ensure that sufficient "overlap" and "knowledge transfer" training time will be available with the experienced employees before they leave.

Q: What is KCPL's plan to address these workforce challenges?

A: There are a number of ongoing efforts in various areas. First, KCPL has introduced a corporate-wide "winning culture" initiative to improve employee engagement and accountability in the business. This has involved efforts such as leadership development and training programs, increased emphasis on communication throughout the organization and encouragement of learning and growth opportunities at all levels. As the effects of the "winning culture" are felt, it will have a direct benefit for the recruitment and hiring of new employees as well as the retention of existing employees. In addition, KCPL is continuing development of a Strategic Workforce Plan. This will provide a comprehensive succession plan that integrates all areas of the generation workforce planning including projected retirements, management development and training needs, craft skill requirements, apprentice training durations, operator training needs, recruitment and hiring lead times, etc. KCPL is also enhancing its management training and development programs. In particular, KCPL is emphasizing training for new first-level supervisors.

Both craft apprentice and operator training programs are also receiving a great deal of attention. New and ongoing craft apprentice classes are in progress. KCPL has evaluated the operator training processes and determined that additional trainers will be needed to support the increased volume of operators requiring both initial and refresher training. KCPL is considering increasing the "off-shift" use of the existing unit-specific training simulators at each plant site. KCPL has added additional support for efforts to recruit both skilled and entry-level new employees.

Q: What is KCPL doing to address performance improvements needed to maintain high levels of output from its existing generating assets?

A: There are a variety of performance improvement projects focused in four key areas. The first area involves process improvement projects such as the Electric Power Research Institute ("EPRI") Plant Reliability Optimization ("PRO") process that has been implemented at LaCygne. The purpose of the PRO process is to facilitate moving plant maintenance work from a reactive mode to a proactive (or planned) maintenance strategy. The PRO process also provides a means to communicate and share best practices on a consistent basis between plants. For example, by using the PRO maintenance basis and root-cause analysis, equipment breakdown information at one location can easily be discussed with the other plant sites. A key strategy in the process improvement effort is the increased utilization of industry collaboration opportunities to share experiences and operating practices with other utilities.

The second major area of performance improvements relates to outage planning and work execution. As the cost of a lost day of production has increased, the focus of outage management has moved from one of cost control to that of schedule control. The goal is to minimize the outage durations while still accomplishing all the work necessary to operate the unit until the next scheduled outage. KCPL continues to focus on developing more comprehensive integrated outage schedules that it can analyze to determine the shortest schedule well in advance of the outage. Another major component of maintenance planning is the development of standardized work packages. KCPL is working to develop standardized work packages for maintenance at all of its generating stations. Having pre-planned work packages greatly improves crew productivity by

having all the information and material necessary to do the maintenance task ready when the work is assigned.

The use of technology is the third significant area of performance improvement initiatives for KCPL. For a number of years, KCPL has utilized dedicated predictive maintenance teams at each plant site to gather data (vibration, oil sampling, thermography, sonic testing, etc.) to proactively look for early "warning" signs of possible equipment failures. These efforts have been successful and are a key component of the PRO process. KCPL has installed a new technology application called "Smart Signal" on each KCPL generating unit. "Smart Signal" is a proprietary process that takes real-time plant operating data and feeds it into a model that compares it to "normal" conditions. Any deviation can be an indication of an equipment problem needing attention. "Smart Signal" is also a "backup" tool that can assist new or inexperienced employees during trouble-shooting activities.

The "Pi" data historian that is part of each unit's Distributed Controls System is another technology that is being utilized to detect "abnormal" trends that could indicate equipment or operational problems. Data from the Pi historian can be automatically trended and plotted against other related trend data to highlight concerns.

Each KCPL unit has a plant-specific operations simulator for operator training. Evaluations are underway to expand the use of these simulators to accomplish increased operator training during off-shifts. The simulators are also proving valuable in allowing "trial" runs of proposed changes in operating procedures or practices.

The fourth major area of plant improvements involves upgrades or retrofit projects to the existing stations. These projects may be necessary for a number of reasons such as aging

plant components reaching the end of their useful life and projects to increase the efficiency of the plant. With the age of the KCPL generating stations, there are numerous components that have reached the end of their useful lives and are required to be changed out. These change-outs could be for safety reasons or to maintain the existing output and reliability of the plants. An example of this situation is the reheater and economizer sections of the LaCygne Unit 2 that we changed out in 2006 and the Iatan Unit 1 and LaCygne Unit 1 reheaters that are being replaced in 2007. Examples of efficiency projects that have or will be occurring are the LaCygne Unit 1 and Iatan Unit 1 turbine/generators. In both cases, the replacement of aging components will result in greater unit efficiency. This is a very beneficial opportunity from both an economic and an environmental viewpoint.

Q: Has KCPL dedicated any resources to achieving results in these key performance areas?

A: Yes, KCPL has established an Operations and Maintenance Programs department that will lead or support key activities in these previously mentioned performance improvement areas.

Q: Can you provide specific examples of these key activities?

A: Yes. In the first area of process improvement the group will evaluate and lead the PRO process. The group will first meet with LaCygne Station to evaluate the current health of the process and then develop a time line to implement the process at Iatan Station. In the second area of performance improvement, outage planning and work execution, the group plans to take over management of the current CMMS (computerized maintenance management system) including document management for the Supply division. The

group will evaluate the current level of standardized work package development as well as the potential replacement of the current CMMS software. In the third area of performance improvement, the use of technology, Operations Programs will take a lead role in the areas of simulator training and "Smart Signal" utilization. Each plant will have an Operations Programs staff that will lead and direct activities related to plant operations training. Operations and Maintenance Programs will work closely with the Supply Engineering Services department to facilitate daily monitoring and analysis of performance through the use of "Smart Signal", "Pi", and DCS information.

II. MAINTENANCE NORMALIZATION

Q: Are you sponsoring any adjustments to the test year cost of service in this filing?

A: Yes. I am sponsoring Adj-26a, Maintenance Normalization-Production, and Adj-52, Annualized Maintenance-LaCygne Unit 1 SCR, both included in the Summary of Adjustments attached as Schedule JPW-2 in the direct testimony of KCPL witness John P. Weisensee.

Q: Why is the first adjustment necessary?

A: Certain significant maintenance activities at KCPL's generating units such as major boiler or turbine overhauls do not occur annually, but rather on a periodic cycle that may occur every two to seven years, depending on the type of maintenance. It is necessary to adjust the actual costs incurred during the test year to a "normalized" level of maintenance expense that considers the periodic timing of major overhauls and arrives at a more levelized amount of annual expense.

Q: Are there differences between how KCPL addressed the maintenance steam accounts (510-514) and the other productions accounts (551-554)?

A: Yes. The steam accounts (510-514) include the scheduled boiler and turbine outages on the coal-fired generating units. These outages can cause a very large variance in non-KCPL labor maintenance expense, as much as several million dollars, therefore KCPL is proposing the use of a multi-year average indexed to 2006 dollars for these accounts. The other production accounts (551-554) would not normally have the large variances in non-KCPL labor maintenance expense and therefore KCPL proposes using the 2006 test year dollars as the basis for these accounts before certain specific adjustments discussed below.

Q: Are there other factors supporting KCPL's proposal to use the test year of 2006 for the other production accounts (551-554)?

A: Yes. KCPL added 5 simple cycle combustion turbines (West Gardner 1-4 and Osawatomie 1) in 2003. The maintenance of the units would fall in accounts 551-554. Since KCPL acceptance of these units was mid-year 2003, previous years would not include costs associated with the new CT fleet. Also, years 2004 and 2005 would include warranty work and also be expected to be low in relation to a "normal" year. Also included in accounts 551-554 is maintenance on the new Spearville Wind Energy Facility placed in service during the second half of 2006 for which historical data is not available.

Q: Explain the method used for maintenance normalization of the steam accounts (510-514) as it pertains to generating unit maintenance costs.

A: Coal-fired steam generating units require scheduled maintenance to maintain reliability. Each unit's outage schedules are unique and based on many factors. Some of these factors include design parameters, such as supercritical verses sub-critical and cyclone-fired verses pulverized coal-fired. Other factors include operating data like number of

starts, operating hours, and capacity factor. Still other factors include inspection reports from previous inspections and manufacturer recommendations.

Q: How does a routine scheduled outage typically affect KCPL's maintenance expenses?

A: Routine scheduled outages generally require the addition of contract crews to complete the necessary work in a reasonable timeframe. The maintenance cost for contractors, their equipment and the materials utilized during a routine scheduled overhaul will normally result in an increase in non-KCPL labor maintenance expenditures of several million or more over the amount of non-labor maintenance expense experienced in a non-outage period.

Q: What would typically be your longest cycle for these scheduled outages?

A: As explained earlier, each unit's outage schedule is based on many factors. Typically boiler outages are scheduled roughly every 2 years, and turbine outages are scheduled roughly every 7 years. The recommendation for normalizing maintenance expense for the steam accounts (510-514) over a 7-year period is designed to cover the longest maintenance cycle.

Q: Has KCPL quantified a comparison of its 2006 maintenance expense to the expenses KCPL has historically experienced?

A: Yes, KCPL quantified the comparison by restating KCPL's historical maintenance expenses in 2006 dollars and comparing those expenses to KCPL's 2006 maintenance expenses. The low level of maintenance expense in 2006 is evident when compared to these historic figures. Due to planned outage schedule changes, the year of 2006 had significantly fewer outage days than a typical year. This difference, combined with a

Stores inventory adjustment, were the main drivers of the abnormally low maintenance expenses for 2006. To accurately compare historic costs to current costs, the costs must take into account escalation and view expenditures in "same-year-dollars." Handy-Whitman is a highly recognized independent source of historical escalation factors, which are widely used as a standard measure of historic escalation. The historic figures shown in the attached Schedule FDC-1 **(HC)** have been adjusted to 2006 dollars utilizing the Handy-Whitman index. Schedule FDC-1 **(HC)** demonstrates that 2006 non-labor maintenance expense is well below annual reported spending between 2000-2006. Note that Grand Avenue and Wolf Creek are NOT included in the costs shown in Schedule FDC-1 **(HC)**. This is because Wolf Creek utilizes an accounting process that defers the actual operations and maintenance costs of refueling outage and amortizes the deferred costs to expense evenly over the 18-month cycle until the next refueling outage, which maintains fairly constant maintenance expense at Wolf Creek. Grand Avenue is no longer a maintenance liability for KCPL.

Q: Please describe a more appropriate measure of normalized maintenance expense for steam accounts (510-514).

A: Due to the issues mentioned above, KCPL recommends utilizing a seven-year indexed average incorporating 2000-2006 to establish an equitable and normal expectation for the base level of annual maintenance expense for accounts (510-514).

Q: Are there any adjustments KCPL is recommending to the 7-year average indexed to 2006 dollars for accounts (510-514).

A: Yes. KCPL is recommending three adjustments to the 2006 indexed, 7-year average (2000-2006) for accounts 510-514.

Q: What is the first adjustment KCPL is recommending to accounts 510-514?

A: The first adjustment is to remove $46,874 for Grand Avenue Station. This station is no longer owned by KCPL and is therefore no longer a maintenance liability.

Q: What is the second adjustment KCPL is recommending to accounts 510-514?

A: The second adjustment considers the fact that Hawthorn Unit 5 was under construction early in the 2000-2006 period. The unit went in-service in June of 2001. 2001 and 2002 are considered to be unusual years for maintenance expense on Hawthorn Unit 5 for the following reasons: (i) a significant level of warranty maintenance was performed at no cost to KCPL; and (ii) the unit was essentially new and therefore would not be expected to require the same level of maintenance as a unit with five or more years of wear and tear, *e.g.*, boiler tube failures would not be expected as a result of numerous heat cycles or other longer-term operating impacts.

For Hawthorn Unit 5, the recommendation is to utilize the four-year average of 2003-2006. Although these years still reflect an essentially new unit and therefore lower maintenance expense than we would anticipate in later years, 2003-2006 are much more indicative of the expected maintenance expense than 2000-2002. The annual levels of maintenance expense for Hawthorn Unit 5 are shown in the attached Schedule FDC-2 **(HC)**, which clearly shows the unusually low maintenance expense in the years 2000-2002. The adjustment for Hawthorn Unit 5 is $1,379,497 comparing the 4-year average (2003-2006) to the 7-year average (2000-2006).

Q: What is the third adjustment KCPL is recommending to accounts 510-514?

A: The third adjustment pertains to the Hawthorn Unit 5 turbine overhaul cycle. Hawthorn Unit 5 has implemented “sectionalized turbine overhauls”. Under this plan, individual

sections of the turbine will receive maintenance on a rotating basis. The Hawthorn Unit 5 turbine will be maintained in three "sections", HP/IP section, LP section, and generator. Plans call for the valve work to be on a 2-year cycle, turbine work to be on a 7-year cycle, and the generator work will be on a 10-year cycle. The result on turbine performance is expected to be similar to a standard turbine overhaul cycle. However, the proposed approach will avoid the need for scheduling the much longer turbine outages required under a standard turbine overhaul cycle.

The 2007-2011 budgets for the Hawthorn Unit 5 turbine are shown in the attached Schedule FDC-3 **(HC)**. The resulting adjustment is $562,400 per year.

Q: Are there any adjustments to the other production accounts 551-554?

A: Yes, there are three adjustments to other production accounts 551-554. The first adjustment is associated with the new Spearville Wind Energy Facility. Spearville went into service the end of September of 2006. The non-KCPL labor maintenance costs for Spearville are included in accounts 551-554. The 2007 Spearville non-KCPL labor budget is shown in the attached Schedule FDC-4 **(HC)**. This budget is based on contracted cost for the provision of maintenance from an outside vendor. The adjustment for Spearville is $1,537,853, which is the 2007 budget ($1,838,119) minus the 2006 expenses ($300,266) that were recorded in accounts 551-554.

Q: What is the second adjustment to other production accounts 551-554?

The second adjustment is related to KCPL's fleet of simple cycle gas turbines. KCPL currently owns and operates 7 simple cycle combustion turbines, Hawthorn Units 7 & 8, West Gardner Units 1-4, and Osawatomie Unit 1. Hawthorn Units 7 & 8 are General Electric 7 EA gas turbines and General Electric 7A7 air-cooled generators. West Gardner

Units 1-4 and Osawatomie Unit 1 are General Electric 7 EA gas turbines and Brush air-cooled generators. General Electric recommends a combustion inspection/overhaul on these units every 400 starts or 8000 hours. The annualized cost of these inspections/overhauls is $385,000. See the attached Schedule FDC-5 **(HC)** for details regarding these inspection/overhauls.

Q: What is the third adjustment to other production accounts 551-554?

A: The third adjustment pertains to Hawthorn Unit 6. Hawthorn Unit 6 is a Siemens V84.3A1 gas turbine and Siemens air-cooled generator. Siemens recommends a Hot Gas path inspection/overhaul every 25,000 EOH (equivalent operating hours) or 6 years. The annualized cost for this inspection/overhaul is $116,667. See attached Schedule FDC-6 **(HC)** for additional information regarding this inspection/overhaul.

Q: Please describe normalized adjustment Adj-52 for Comprehensive Energy Plan additions.

A: KCPL's future annual maintenance expense is expected to be impacted by the addition of new generating resources and new environmental control equipment.

The May 2007 addition of an operating Selective Catalytic Reduction ("SCR") on LaCygne Unit 1 is one example. See KCPL witness John Grimwade's direct testimony for design and in-service criteria of the LaCgyne Unit 1 SCR. The maintenance impacts of the LaCygne Unit 1 SCR are shown in the attached Schedule FDC-7 **(HC)**. The total amount of this adjustment is $2,224,162, which includes $1,931,700 of ammonia costs from account 501 as fuel additives.

Q: Can you summarize the adjustments to the 2006 projected test year, which are recommended to reflect a normalized maintenance year?

A: A summary of the recommended adjustments is shown in the attached Schedule FDC-8 **(HC)**, Summary of Normalized Adjustments. The first series of entries deal with steam accounts 510-514. There are four adjustments in this section. The first adjustment is $3,540,129, which is the difference between the seven-year indexed average (2000-2006) and the 2006 test year for accounts 510-514. The second adjustment is to remove Grand Avenue, a downward adjustment of $46,874. The third adjustment is $1,379,497, which represents the difference between the proposed 7-year average (2000-2006) and a more representative 4-year average (2003-2006) for Hawthorn Unit 5. The final adjustment for steam accounts 510-514 is $562,400, which is based on the Hawthorn Unit 5 turbine overhaul cycle. The normalized total for steam account 510-514 is now shown as $27,489,357. The next part of the adjustment summary sheet covers other production accounts 551-554. There are three adjustments proposed for other production accounts 551-554. The first adjustment subtracts the 2006 partial year expenses for the Spearville Wind Energy Facility since a full year of expenses will be added in latter. The next two adjustments deal with the combustion turbine inspection/overhaul expenses. The normalized total for other production accounts 551-554 minus Spearville is now shown as $1,046,792. The last entry for Adjustment 26a projects a full year of expenses for the Spearville Wind Energy Facility versus the partial year of expenses included the 2006 test year. The adjustment of $1,537,853 resulted in a normalized total for wind maintenance in the other production accounts (551-554) of $1,838,119. The total of Adjustment 26a is now shown as $7,474,671 for a normalized total of $30,374,267. The last adjustment is for LaCygne Unit 1 SCR, Adjustment 52. After this adjustment the

grand total of adjustments is $9,698,833 and the final normalized total amount is $32,598,429.

Q: How does this final normalized total compare to KCPL's Supply Division 2008 non-labor maintenance budget?

A: The current 2008 non-KCPL labor maintenance budget is $32,037,917. It should be noted that this budget number does not include the LaCygne Unit 1 ammonia cost of $1,931,700 contained in account 501.

Q: Looking to future years has KCPL experienced an abnormal increase in the cost of goods and services?

A: Yes, KCPL has seen unprecedented increases in the cost of products and materials such as metals, chemicals/ammonia, gasoline/diesel and the contractor labor. An internal study was completed to access the effects of inflation on these goods and services that KCPL needs to conduct its business. KCPL looked at the top 80% of plant expenditures and found the average annual inflation rate to be 7.7% over the past 3 years. Some of these materials have experienced average inflation rates of over 25% per year over the past 3 years.

Q: Does that conclude your testimony?

A: Yes, it does.

BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF MISSOURI

In the Matter of the Application of Kansas City Power & Light Company to Modify Its Tariffs to Continue the Implementation of Its Regulatory Plan	)))	Case No. ER-2007-____

AFFIDAVIT OF F. DANA CRAWFORD

STATE OF MISSOURI)
) **ss**
COUNTY OF JACKSON)

F. Dana Crawford, being first duly sworn on his oath, states:

1. My name is F. Dana Crawford. I work in Kansas City, Missouri, and I am employed by Kansas City Power & Light Company as Vice President, Plant Operations.

2. Attached hereto and made a part hereof for all purposes is my Direct Testimony on behalf of Kansas City Power & Light Company consisting of sixteen (16) pages and Schedules FDC-1 through FDC-8, all of which having been prepared in written form for introduction into evidence in the above-captioned docket.

3. I have knowledge of the matters set forth therein. I hereby swear and affirm that my answers contained in the attached testimony to the questions therein propounded, including any attachments thereto, are true and accurate to the best of my knowledge, information and belief.

F. Dana Crawford

Subscribed and sworn before me this 31st day of January 2007.

Nicole A. Wehry
Notary Public

My commission expires: Feb. 4 2007

NICOLE A. WEHRY
Notary Public - Notary Seal
STATE OF MISSOURI
Jackson County
My Commission Expires: Feb. 4, 2007

SCHEDULES FDC-1 through FDC-8

THESE DOCUMENTS CONTAIN HIGHLY CONFIDENTIAL INFORMATION NOT AVAILABLE TO THE PUBLIC