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Witness:	F. Dana Crawford
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Sponsoring Party:	Aquila, Inc. dba KCP&L Greater Missouri Operations Company
Case No.:	ER-2009-____
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MISSOURI PUBLIC SERVICE COMMISSION

CASE NO.: ER-2009-____

DIRECT TESTIMONY

OF

F. DANA CRAWFORD

ON BEHALF OF

AQUILA, INC. dba
KCP&L GREATER MISSOURI OPERATIONS COMPANY

Kansas City, Missouri
September 2008

DIRECT TESTIMONY

OF

F. DANA CRAWFORD

Case No. ER-2009-____

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 ("KCP&L") as Vice President - Plant Operations. I also serve in that capacity for Aquila, Inc. dba KCP&L Greater Missouri Operations Company ("GMO").

Q: What are your responsibilities?

A: My responsibilities include the direction of the operation and maintenance of the fossil-fuel generating stations of KCP&L and GMO 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 KCP&L 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 KCP&L's rate case concerning the Wolf Creek Nuclear Generating Station and in the case pertaining to the acquisition of Aquila, Inc. by Great Plains Energy Incorporated. I also submitted testimony in KCP&L's 2006 rate case in Case No. ER-2006-0314 and 2007 rate case in Case No. ER-2007-0291.

Q: What is the purpose of your testimony?

A: The purpose of my testimony is threefold. First, I provide historical information concerning KCP&L's plant operations and outline the steps KCP&L needs to take to continue the successful operation of its generation facilities. Second, I discuss how these practices will apply to GMO plant operations. Third, I provide an update of the scrubber rebuild project that is occurring at the Jeffrey Energy Center in which GMO owns an 8% interest.

I. PLANT PERFORMANCE INITIATIVES

Q: Please describe KCP&L's historical operation of its generating units?

A: KCP&L has had significant success in the operation of its generating units. The net generation produced by KCP&L'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 KCP&L'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 to continue this success at GMO and KCP&L?

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.

Second, 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 GMO and KCP&L face regarding the generating station workforce?

A: GMO and KCP&L have a very experienced workforce for their generating stations, many of whom were hired at the time of construction of the units and are now nearing retirement age. Because of the potential retirements of so many experienced employees, GMO and KCP&L will have significant ongoing recruitment, hiring and training efforts for the needed replacement employees. In addition, GMO and KCP&L 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 KCP&L's plan to address these workforce challenges at GMO and KCP&L?

A: There are a number of ongoing efforts in various areas. First, KCP&L 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, KCP&L 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, and recruitment and hiring lead times.

KCP&L is also enhancing its management training and development programs. In particular, KCP&L 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. KCP&L 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. Since last year, KCP&L has added five "central staff" positions to enhance procedure development and training enhancement. KCP&L has increased the "off-shift" use of the

existing unit-specific training simulators at each plant site. KCP&L has added additional support for efforts to recruit both skilled and entry-level new employees.

Q: What is KCP&L doing to address performance improvements needed to maintain high levels of output from the generating assets of GMO and KCP&L?

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. Since last year we have put together a team of employees that represent all of the coal fired plants to help implement this process. The team attended this year's EPRI PRO user's group meeting in July. Additionally, we contracted with EPRI to perform an Operations and Maintenance Audit at our LaCygne Station. This audit was conducted in August of this year and will be the basis of a 3-day strategy meeting involving all the plant managers and the newly established PRO team. The purpose of the strategy session will be to identify improvement opportunities, establish processes to move toward best practices, identify the resources needed to accomplish the improvements, and establish a time line for the goals.

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. KCP&L 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. This year, KCP&L plans to staff an outage management group to further assist in this area. Another major component of maintenance planning is the development of standardized work packages. KCP&L is working to develop standardized work packages for maintenance at all of the GMO and KCP&L 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. This year KCP&L will be implementing a new work scheduling tool at all of the GMO and KCP&L coal-fired facilities called Planning and Scheduling Tool Assistant ("PASTA"). The goal of the tool is to enhance our ability to plan and organize our routine maintenance activities.

The use of technology is the third significant area of performance improvement initiatives for GMO and KCP&L. For a number of years, KCP&L 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. KCP&L has installed a new technology application called "Smart Signal" on each KCP&L 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 newer employees during trouble-shooting activities. We are currently in the process of updating our current equipment models and training personnel on utilization of the process. Plans are to complete this process in early fourth quarter 2008.

The "Pi" data historian that is part of each unit's Distributed Controls System is another technology 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 KCP&L 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 GMO and KCP&L 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, to maintain the existing output and reliability of the plants, or to provide greater unit efficiency. This is a very beneficial opportunity from both an economic and an environmental viewpoint.

Q: Can you give an update on the accomplishment of the newly established Operations and Maintenance Programs department?

A: Yes. KCP&L established an Operations and Maintenance Programs department in 2007 that is leading or supporting these previously mentioned performance improvement areas. This department has grown from 13 employees in 2007 to a current staff of 23 employees with a goal of 28 employees by the end of 2008. Future projects for this group include development and implementation of an electronic log process to improve communication, enhancements to simulator capability through software upgrades, improvements to training through increased program structure and improved presentation, and documentation of stores and maintenance processes.

Q: Please discuss KCP&L's upgraded flow accelerated corrosion program.

A. After the main root cause of the incident at the Iatan 1 generating station was determined to be flow accelerated corrosion, the company significantly upgraded its flow accelerated corrosion program. Currently, a small part of the program also includes American Society of Mechanical Engineers ("ASME") B31.1 Chapter 7 documentation compliance. The latest version of the ASME B31.1 Power Piping Code provides recommendations for implementing a program to assess and document the condition of the components of a covered piping system. The covered piping systems include four-inch normal pipe size and larger main steam, cold reheat, hot reheat and feedwater piping systems and four-inch normal pipe size and larger systems that operate above 750 degrees F or above 1,025 psig. I further discuss this program in the maintenance normalization section of my testimony.

II. APPLICATION OF INITIATIVES TO GMO PLANT OPERATIONS

Q: Do the same workforce challenges affect GMO plant operations?

A: Yes. We plan to expand the "winning culture" initiative and the Strategic Workforce Plan, described earlier in my testimony, to all GMO generation facilities. Additionally, as other training and development programs are implemented, they will be deployed across all KCP&L operations including GMO.

Q: Can you give me examples of some other initiatives that will be applied to GMO plant operations?

A: Yes. The first initiative that we will expand to the GMO plant operations fleet will be to add emphasis to the area of operator and maintenance training. We plan to utilize our newly established Operations and Maintenance Programs department to provide support to all the GMO generation sites. As previously discussed, this department has responsibility for operations and maintenance training as well as implementing the EPRI PRO process. The purpose of the PRO process is to facilitate moving plant maintenance work from a reactive mode to a proactive (planned) maintenance strategy.

Q: What other initiatives will you apply to the GMO plant operations fleet?

A: Other initiatives that we plan to apply to the GMO plant operations fleet include the EPRI Boiler Tube Failure Reduction and Chemistry Improvement program, our newly established flow accelerated corrosion program, and implementing a proprietary unit data management system called "Smart Signal."

Q: Can you further explain these initiatives?

A: Yes. The EPRI Boiler Tube Failure Reduction and Chemistry Improvement program is designed to reduce boiler tube failures through increased inspection, root cause

identification of failures, and planned tube section replacement. The program is designed to reduce or eliminate water chemistry induced boiler tube failures through the use of increased instrumentation and strict adherence to established chemistry limits. Boiler Tube failures are the industry leading cause of coal-fired generating unit forced outages. The flow accelerated corrosion program is designed to identify and then replace any section of piping or valve that is determined to be thinned past the established ASME minimum operating code guidelines. "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. The purpose of this tool is to increase reliability and reduce forced outage and de-rate time.

I. JEFFREY ENERGY CENTER

Q: What is the purpose of this section of your testimony?

A: The purpose of this section of my testimony is (i) to provide an overview of the air quality control equipment project underway at the Jeffrey Energy Center ("Jeffrey"), including a description of the oversight of the project and (ii) to explain how the anticipated cost to complete the project compares to the initial estimate.

Q: Please describe the air quality control equipment project at Jeffrey.

A: Jeffrey is principally comprised of three coal-fired generating units, each with a generating capacity of 720 MW. The three units were completed in 1978, 1980, and 1983, respectively. Each unit was built with a flue gas desulphurization system ("Scrubber") of that vintage. A Scrubber reduces the amount of sulfur dioxide ("SO_2") emitted into the atmosphere. The current project consists of rebuilding the three

scrubbers to contemporary standards and upgrades to plant auxiliary systems to accommodate the additional requirements of the equipment. Work associated with the project includes additional material handling systems, treatment systems, pumps, ductwork, dampers, continuous emissions monitoring equipment, supporting structures, and other related facilities.

Q: What is the schedule for the installation of the Scrubbers at Jeffrey?

A: The Scrubber for unit 1 was completed in August 2008, and initial scrubbing began in July 2008. The Scrubber for unit 2 is scheduled to be completed in May 2009. The Scrubber for unit 3 is scheduled to be completed in December 2008.

Q: Who owns Jeffery?

A: GMO owns eight percent of Jeffrey. Through its subsidiaries, Westar Energy ("Westar") owns eighty-four percent of the facility and leases the remaining eight percent.

Q: How was the decision made to undertake the air quality control project at Jeffrey?

A: Westar decided to undertake the project, which is intended to meet the requirements of the Clean Air Interstate Rule, and reduce SO_2 emissions by over 95%. Although the project was undertaken prior to the technical required date of January 1, 2014, the decision to build the project early was justified by the expectation of increasing labor and material costs as utilities with similar projects rushed to complete all of them by the deadline. It was clear that not every utility could wait and be confident that their project would be complete and operating efficiently prior to 2014. Early completion would also allow for the economic benefit of selling emissions allowances with the proceeds used to partially offset the cost of the project. In addition, Aquila did its own evaluation of the

project and concluded that it was economic. Based upon its review and analysis of the project, Aquila provided a letter of concurrence to Westar in February 2007.

Q: Were alternatives to rebuilding the existing scrubbers considered?

A: Yes. Replacement with new equipment was considered as an alternative. The estimated cost was considerably higher than the alternative selected.

Q: **Who is responsible for rebuilding the Scrubbers at Jeffrey?**

A: Westar is managing the project. Burns & McDonnell is the engineer for the project and provides estimates, engineering, and procurement information, and construction management assistance.

Q: What is the currently anticipated cost of the Jeffrey project?

A: As described above, the rebuild of the Scrubbers is not yet complete. Consequently, the Company does not know at this time the precise cost of the project. The exact dollar amount will be determined as part of the true-up process in this case. However, the total cost of the project is presently estimated to be $415.3 million on a total project basis. GMO's eight percent share of that number would be $33.2 million.

Q: How does the current estimated cost of completion compare to the initial estimate?

A: The estimate of direct capital cost initially provided to Westar by Burns & McDonnell in early 2006, and in turn provided to Aquila, was approximately $244 million. The first official estimate with owner's cost included was $270 million. The official budget, with owner's costs and other items included, was $345 million from January 2007 to the middle of 2008. Based upon that number, the current estimate is about twenty percent higher.

Q: What are the primary reasons for the anticipated cost increases?

A: The initial capital cost estimate of $255 million reflected only "hard" costs and was in 2005 dollars, and did not include taxes, construction management, Westar's owners' costs (such as purchasing, legal, regulatory, engineering and project management), permitting and licensing costs, performance bonds for individual contracts, and cost of mobile equipment needed to move limestone. Escalation in labor, materials and equipment from 2005 estimates was not included. The initial official budget of $345 million included those items and other scope changes related to environmental requirements of the Kansas Departmental of Health and Environment ("KDHE").

Normal design maturation issues that occurred during construction accounted for an increase in the project estimate from $345 million to $360 million. A reforecast of the project costs was performed this summer after it became clear that a major contractor would not be able to complete the remainder of its contact scope on a fixed-price basis.

Q: What was the contractor's scope and what corrective actions were taken by Westar?

A: The contractor was selected to be the general contractor for all but electrical and foundation work. Their scope included steel erection, ductwork, and equipment setting and alignment. While they were a smaller firm than some other bidders, the contractor's bid was substantially below the price of the next lowest bidder, making a compelling case to award the job to this contractor, notwithstanding the higher risk of the contractor becoming unable to complete the work according to its contract. During the Unit 1 outage in Spring 2008, it became clear that the contractor's cash flow needs to complete their work exceeded the payments they were entitled to under the fixed-price contract and that they would be unable to complete their scope at the contract price. Westar compared

the merits of replacing the contractor and rebidding the remaining work with continuing with the incumbent contractor, but with significantly different conditions. Key among the considerations was the knowledge that other contractors would come in with a much higher price and the risk that mobilization requirements for a new contractor could negatively impact the completion schedule for Units 2 and 3. Its analysis caused Westar to conclude that the project could be completed at a lower cost by retaining the incumbent contractor, paying the contractor additional amounts as necessary to complete the work, but managing the contractor's cash flows directly and subjecting the contractor to the direct construction management oversight of Burns and McDonnell.

Q: Was the initial cost estimate wrong or inadequate?

A: No. In my opinion, the initial estimate was a good number based upon the information that was available at the time it was developed.

Q: What steps were taken to control the cost of the Jeffrey Scrubber rebuild project?

A: Westar hired Burns & McDonnell, a highly qualified and experienced firm to perform construction oversight as well as provide engineering and procurement services. In turn, Westar formed a dedicated officer-lead department to oversee its large generation projects, including overseeing the management of Burns and McDonnell. Contract awards were made using competitive bidding, with technical and commercial evaluations by Westar and Burns & McDonnell before award. Oversight by Westar and Burns & McDonnell includes preparing, maintaining and updating project schedules and budgets on a monthly basis, and managing the job against budget and schedule, using an earned value system to track performance. A strong emphasis has been placed on safety, which supports project schedule as incident rates are reduced or minimized. Jeffrey is an OSHA

Voluntary Protection Program ("VPP") site, and has achieved "Star" status which is the highest rating awarded by OSHA. This is an uncommon achievement in the power industry.

Q: With these monitoring activities in place, how do you explain the discrepancy between the estimated cost to complete the projects and the initial estimate?

A: Cost monitoring systems cannot guarantee that a project will not experience cost pressures. Nothing can do that. For example, a fixed-price contract is only as good as the contractor's ability to estimate accurately, attract the needed labor resources, and to manage its own costs in such a way as to allow it to stay in business. The construction industry as a whole, and in particular power plant-related construction, has experienced intense cost pressures over the last few years. Global and domestic prices for general construction materials and the specialized components for a project such as this have risen dramatically. In addition, a national shortage of skilled construction craft labor has made the labor market particularly challenging as owners and contractors compete to attract skilled talent to their job sites. Operating in this environment, I believe Westar with oversight from GMO managed costs effectively. Without the efforts Westar has taken, the ultimate cost of the project would be higher than it is currently estimated to be, and there would be risk to the schedule.

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 Aquila, Inc. dba KCP&L Greater Missouri Operations Company to Modify Its Electric Tariffs to Effectuate a Rate Increase	)))	Case No. ER-2009-____

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 Aquila, Inc. dba KCP&L Greater Missouri Operations Company consisting of Fifteen (15) pages, 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 5th day of ~~August~~ September 2008.

Nicole A. Wehry
Notary Public

My commission expires: Feb. 4 2011

" NOTARY SEAL "
Nicole A. Wehry, Notary Public
Jackson County, State of Missouri
My Commission Expires 2/4/2011
Commission Number 07391200