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Witness:	Mark C. Birk
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MISSOURI PUBLIC SERVICE COMMISSION

Case No. ER-2007-0002

DIRECT TESTIMONY

OF

MARK C. BIRK

ON

BEHALF OF

UNION ELECTRIC COMPANY
d/b/a AmerenUE

St. Louis, Missouri
July, 2006

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DIRECT TESTIMONY

OF

MARK C. BIRK

CASE NO. ER-2007-0002

I. INTRODUCTION

Q. Please state your name and business address.

A. My name is Mark C. Birk. My business address is One Ameren Plaza, 1901 Chouteau Avenue, St. Louis, Missouri 63103.

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

A. I am employed by Union Electric Company d/b/a AmerenUE (Company or AmerenUE) as Vice President of Power Operations.

Q. Please describe your educational background and employment experience.

A. I received my B.S.E.E. from the University of Missouri-Rolla in 1986 and my M.S.E.E. from the same institution in 1991. I am a licensed engineer in the State of Missouri. I began my employment with Union Electric Company in 1986 as an assistant engineer in the nuclear function. In 1989, I transferred to Union Electric's Meramec Power Plant as an electrical engineer. In 1996, I transferred to the Energy Supply Operations Group and became a Power Supply Supervisor. I became Manager of Energy Supply Operations in the Spring of 2000. I became General Manager of Energy Delivery Technical Services in the Fall of 2001 and Vice President of that department in 2002. I became Vice President of Ameren Energy, Inc., Ameren Corporation’s short-term trading affiliate, in the fall of 2003

and assumed my current position with AmerenUE as Vice President of Power Operations in September of 2004.

Q. Please summarize your duties and responsibilities as Vice President of Power Supply Operations for AmerenUE.

A. I am responsible for all of the generation assets of AmerenUE, except the Callaway Nuclear Plant, which is within the responsibility of Charles D. Naslund. Mr. Naslund is submitting direct testimony that discusses the Callaway Plant. My responsibility for AmerenUE's non-nuclear generating assets includes responsibility for their safe, reliable, and efficient operation. Unless otherwise noted, when I refer in my testimony to generating fleet, infrastructure, or plants, I will be referring to AmerenUE's non-nuclear generating assets.

II. PURPOSE AND SUMMARY OF DIRECT TESTIMONY

Q. What is the purpose of your direct testimony?

A. The purpose of my direct testimony is to explain AmerenUE's ongoing investments in its electric generation infrastructure. I will also describe reliability improvements resulting from programs implemented at AmerenUE, including AmerenUE's Plant Reliability Optimization (PRO), Plant Maintenance Optimization (PMO), and Corrective Action Plan (CAP) programs.

In addition to explaining the above-referenced investments and reliability programs, I will also describe additions to AmerenUE's generating fleet made during the last four years. My testimony also includes an explanation of environmental regulations applicable to AmerenUE's generating fleet, including certain new and updated requirements implemented recently or to be implemented in the near future. I will then explain the need

for environmental infrastructure improvements associated with the electric generating facilities which are being driven by these new environmental requirements. In connection with this discussion, I will provide details regarding some of the initial capital and ongoing maintenance costs associated with these environmental infrastructure improvements. Finally, I will provide a brief summary of the upper reservoir failure at the Taum Sauk pumped-storage facility and an update on the status of the investigation of the failure and other matters relating to the Taum Sauk Plant.

Q. Please summarize the principal conclusions reflected in your direct testimony.

A. The following are the principal conclusions reflected in my testimony:

1. AmerenUE has made and will continue to make extensive investments in its generating assets. From January 1, 2002 through March 31, 2006, AmerenUE spent more than $1.7 billion on generating infrastructure, including investments in its coal-fired and hydroelectric plants, the addition of peaking generation, and improvements at the Callaway Plant. More than $1.3 billion was spent on AmerenUE's non-Callaway generating assets, including the addition of several new combustion turbine generating units. Approximately $638 million of investments have been placed in service since January 1, 2002 at the Company's coal-fired and hydroelectric units alone. From January 1, 2002 through December 31, 2006, the capacity of AmerenUE's generating assets (excluding the addition of peaking units) has also been increased by approximately 434 megawatts (MW). Over that

same period, AmerenUE has also increased the "Equivalent Availability" (i.e. the percentage of time an electric power generating unit was available for service during a period) of its coal-fired and hydroelectric units by approximately 10%. These investments have also allowed a substantial increase in the production of electricity on a megawatt-hour (MWh) basis from the Company's coal-fired and hydroelectric plants as evidenced by the 22% increase between 2002 and 2005, from 36.3 million MWhs in 2002 to 44.2 million MWhs in 2005.

2. AmerenUE's ongoing operations and maintenance (O&M) expenditures are escalating due to several factors, including the aging of AmerenUE's fleet (the average fossil unit age is 39 years), continuing increases in raw material and outside services costs, increasing environmental expenses, and increasing capacity factors, particularly at AmerenUE's baseload plants. Capacity factors are increasing because electric loads continue to increase while no new baseload generation has been brought on line since 1984. Through the use of initiatives such as PRO/PMO, CAP, and other operational performance improvements with respect to its generating fleet, AmerenUE has been able to meet the ever increasing electrical energy needs of Missouri customers in an economic manner.

3. There is a definite need for additional generation capacity in Missouri and throughout the nation in order to maintain the reliability of the

electric power supply. As the 2003 blackout in the Northeast showed, local generation close to the load provides for the most secure and reliable way to supply electricity. AmerenUE has continued to invest in new generation, as needed, to meet its increased needs for capacity. Over the past approximately four-year period, AmerenUE has invested more than $700 million in additional peaking capacity needed both to meet its peak needs and to maintain a prudent level of operating reserves.

4. AmerenUE will be required to make significant environmental capital investments and incur associated O&M costs to operate this equipment at many of its fossil plants to meet the requirements of existing, updated, and new environmental regulations, including the Clean Air Interstate Rule (CAIR), the Clean Air Mercury Rule (CAMR), and the Missouri NOx SIP (State Implementation Plan) Call. These environmental capital investments and increased ongoing O&M costs necessitated by those regulations will present significant financial and operational challenges and risks while overall emissions are being reduced.

5. Three different entities, Rizzo Associates (an engineering group with dam expertise hired by AmerenUE), a project team consisting of Federal Energy Regulatory Commission (FERC) engineers familiar with dam safety issues, and a FERC Independent Panel of Consultants (a panel of 3 independent dam design engineers hired by FERC) have

investigated the cause of the Taum Sauk upper reservoir failure which occurred on December 14, 2006. They all generally agree on the root causes of the failure, some of which date back to the plant's original construction in the early 1960s. We are thankful that there was no loss of life from this event and are working diligently to use what has been learned from these investigations to develop a corrective action plan to ensure that a similar event does not happen again. I also want to convey that even though our investigation shows that everyone involved in this incident was well-intentioned, we recognize that the consequences of the failure were substantial. I do believe that at every step of the way our employees took actions they believed were sufficient to protect the facility's safety and the safety of the public, though in hindsight, those steps clearly proved to be inadequate. That is why we are working very hard to take all necessary steps to prevent any similar accident in the future. No final decision on whether the Taum Sauk Plant will be rebuilt has yet been made, but over the next few months we will continue to evaluate options for a possible rebuild of the Taum Sauk Plant. We have asked consultants to begin work on preliminary designs associated with a new upper reservoir and would expect, if a decision is ultimately made to rebuild the plant, that it could be available for service by the summer of 2009.

My direct testimony is also summarized on Attachment A.

III. ELECTRIC GENERATION INFRASTRUCTURE INVESTMENTS

Q. Has the Company made any specific energy infrastructure investment commitments to the Commission?

A. Yes. In resolving the Company's last rate proceeding, Case No. EC-2002-1, the Commission approved a Stipulation and Agreement among the Commission's Staff, the Office of Public Counsel, and various intervenors. As part of that Stipulation, AmerenUE agreed to use commercially reasonable efforts to make between $2.25 and $2.75 billion of energy infrastructure investments from January 1, 2002, to June 30, 2006, including certain specific generation-related investments and transmission upgrades. The transmission upgrades will be discussed in the direct testimony of AmerenUE witness Maureen A. Borkowski. AmerenUE also committed to use commercially reasonable efforts to make upgrades to its existing generating plants to increase their capacity by 270 MW or greater.

Q. Were those commitments met in full?

A. Yes. Approximately $2.6 billion has been spent on energy infrastructure investments and the capacity increases (270 MW or more) at existing generating plants have been achieved. Schedule MCB-1 provides additional information on the expenditures for these infrastructure commitments, including specific generation-related projects and transmission projects which were included in that Stipulation and Agreement.

Q. Please comment more specifically on the level of electric generation infrastructure improvements made by AmerenUE since January 1, 2002.

A. AmerenUE has spent, from January 1, 2002 through March 31, 2006, approximately $1.7 billion on generation infrastructure alone, including investments in its coal-fired and hydroelectric plants, the addition of peaking units, and improvements at the

Callaway Plant. Improvements at the Callaway Plant will be addressed in detail in the direct testimony of Mr. Naslund.

Q. Were the $1.7 billion of generation infrastructure investments placed into service from January 1, 2002 to March 31, 2006?

A. Actually, more than $1.7 billion of generation infrastructure investments was placed in service since January 1, 2002. The $1.7 billion figure represents dollars that were actually spent since January 1, 2002, as contemplated by the Stipulation and Agreement in Case No. EC-2002-1. Additional generating investments were placed in service after that date relating to projects started in 2001.

IV. ELECTRIC GENERATION RELIABILITY PROGRAMS

Q. Please explain programs and initiatives that AmerenUE has put in place to improve plant reliability, availability, and overall operational performance of the generating plants.

A. In order for AmerenUE to reliably supply the growing demand for electricity in its service territory, several initiatives have been implemented to improve plant reliability, availability, and operational performance. Below I will explain the Plant Maintenance Optimization (PMO), Plant Reliability Optimization (PRO), and Corrective Action Process (CAP) programs and show how these programs have helped AmerenUE improve overall plant capability, availability, and capacity factors.

Q. How did the PMO and PRO initiatives begin?

A. The PMO/PRO team was established in late 1999 with the following objectives:

- To increase unit reliability;

- To make more effective use of maintenance resources;
- To become more proactive in performing needed maintenance during planned outages rather than being forced to perform emergency work during unplanned outages;
- To extend intervals between major plant outages and equipment overhauls by repairing equipment on a proactive basis when monitoring data indicates a need; and
- To optimize equipment operation.

The PMO/PRO program was placed in full effect at the Labadie, Rush Island, Sioux, and Meramec Plants in 2002. An engineered maintenance strategy based on failure modes has been implemented for all critical plant equipment that includes predictive technologies (vibration, motor testing, oil analysis, thermography, and operator rounds), preventive maintenance, and needed capital improvements.

Ownership and accountability for critical plant equipment has been assigned to plant personnel. Predictive technologies are used and preventive maintenance activities are performed according to the maintenance strategy to protect critical equipment from unexpected failure. The receipt of data indicating a need for maintenance is managed through regular reliability meetings as well as work week management in the Planning and Scheduling Department at each plant. Performance metrics are reported and utilized to improve the process on a weekly and monthly basis. These performance metrics include leading metrics such as how well we are implementing our maintenance strategy and lagging metrics such as plant equivalent availability.

Q. You also mentioned the CAP program. Please explain this program.

A. Another significant driver in the improvement of equivalent availability and capacity is the Corrective Action Process (CAP). Below I will give some background on CAP, describe its purpose, and summarize observed results.

In 1999, AmerenUE started the CAP at its non-nuclear generation stations. Labadie, Meramec, and Sioux were the first three plants to start using CAP. In 2000 Rush Island started to use CAP, and the hydroelectric units followed in 2001 and 2002.

Besides addressing safety issues associated with Occupational Safety and Health Administration (OSHA) recordable incidents or near misses, the main focus of CAP is to address lost generation or availability improvements. CAP uses an Event Condition Report (ECR), which is the initiating document that captures the details of an event. The trigger level for writing an ECR includes all unplanned unit trips (i.e. whenever the unit goes offline other than as a result of the operator's decision to take it offline) and a certain amount of lost MWhs depending upon the facility.

Once an ECR is written, a formal, documented process must be adhered to ensure that the issue is addressed and that the true root cause is found. Once the root cause is found, corrective actions are written and tracked to ensure completion. From 2002 through the end of 2005, close to 1,200 ECRs were written.

In summary, CAP as employed at the non-nuclear AmerenUE plants is a formal process to ensure issues such as lost generation (reduced availability) are addressed, that the true root cause of each problem is determined, and that appropriate corrective action is actually implemented. AmerenUE's CAP program is currently being enhanced to provide even better root cause analysis and communication across the generating fleet. AmerenUE is

currently focusing on improving the performance of its operating groups by increasing training, refining control system tools, implementing a performance monitoring center, and aligning its talent and resources to best support the operating organization. While AmerenUE is still refining the program, it has already seen improvements at the plants in the areas of trip reduction—a 41% improvement from 2004 to 2005--and equivalent availability—a 7% improvement from 2004 to 2005.

Q. You have described above large levels of investment in the generating stations, as well as implementation of the PMO/PRO and CAP programs. Has AmerenUE made any other noteworthy expenditures since AmerenUE's rate proceeding?

A. Yes. The events of September 11, 2001, have demonstrated the need to improve security at our power plants. In response to Homeland Security Presidential Directive 7 and the Homeland Security Act of 2002 we have implemented the following improvements, at a total cost of about $4 million:

At the four AmerenUE coal-fired plants (Labadie, Rush Island, Sioux and Meramec) we have made improvements to our perimeter fencing, installed additional security cameras and installed guard houses at the perimeter instead of close in to the plant. We have also made improvements at our construction gate entrances by installing card readers and turnstiles in addition to guard houses.

At the Osage hydroelectric plant, a cable barrier was installed to keep potential terrorists away from the dam in addition to other security improvements. The Keokuk hydroelectric plant also implemented security improvements.

Other measures were taken at the Callaway Plant and are discussed in the direct testimony of Mr. Naslund.

V. ELECTRIC GENERATION INFRASTRUCTURE ADDITIONS

Q. What considerations are most relevant in deciding whether to make a major generation addition?

A. Generation additions are in general driven by one of two needs: (a) the need to produce more energy to serve load during a significant number of hours each year, and (b) the need to have capacity available to make sure that load is served reliably and in a least cost manner during peak times, as well as ensuring that a prudent level of operating reserves are maintained. If energy will be needed a significant number of hours each year and if a utility's generating fleet lacks the energy to meet those needs, the utility will consider adding baseload generation. Baseload generation tends to have much higher up-front capital costs, but produces energy at a lower cost per MWh than peaking generation. To meet peak needs and for operating reserve margin needs, the utility will generally consider peaking units. Peaking units tend to have lower up-front capital costs, but are more expensive to run, when they must be run.

Q. Are generation needs increasing?

A. Yes. An adequate supply of reliable electricity is essential to support the standard of living to which we all have become accustomed. Because of the use of computers, the internet, robotics, and all of the other electrical innovation that has taken place in the last 30 years, it takes more energy than ever before to sustain that standard of living, including to sustain the businesses where we work and shop. Moreover, the consequences of a loss of power to our customers due to a lack of generation availability or

an interruption in our transmission and distribution network would be far greater and far more damaging now than it ever was in the past. As an illustration, the Final Report on the August 14, 2003 Blackout in the United States and Canada, prepared jointly by the United States Secretary of Energy and Minister of Natural Resources Canada, states that the economic impact of the Blackout was between $4 and $10 billion, citing a study by the Electric Consumers Research Council. These economic impacts do not take into account the unquantifiable disruption of people's lives caused by such events. Electricity is a commodity that must be produced when consumed because it cannot be stored, so a reliable supply from regionally located generating plants is truly the best way to guarantee that electrical energy will be available when and where it is needed. The increased importance of electricity to our lives and the economy, coupled with the nature of how it must be generated and transmitted, make it more important today than ever before to have adequate generation capacity that is highly reliable once it is in service.

Q. In addition to the very understandable need to maintain a reliable generating fleet so that electricity is available when and where it is needed, are there other aspects of the electric industry today that also require increased reliability of the generating fleet?

A. Yes.

Q. Please explain.

A. As a result of policies implemented by the FERC, most utilities operate as part of regional transmission organizations or "RTOs" which results in a pooling, for dispatch purposes, of the generating resources of various utilities and independent power producers in various regions. AmerenUE is located within the footprint of the Midwest Independent

Transmission System Operator, Inc. (MISO), as discussed in more detail in the direct testimony of Ms. Borkowski.

Q. How does this affect the operation of AmerenUE's generating fleet?

A. The MISO operates competitive wholesale energy markets within its footprint. Each AmerenUE generating unit is bid into the MISO market on a day ahead or real time basis. If a unit is bid in on a day ahead basis, as most of AmerenUE's large fossil units are, the unit is then required the next day to produce the amount of generation each hour that it was bid in for the prior day. If the unit cannot produce its committed amount of generation in any hour, due to equipment or other issues, then AmerenUE is financially penalized by the MISO and incurs additional fees such as Imbalance, Revenue Sufficiency Guarantees, Revenue Neutrality Uplift, and other fees, as addressed in greater detail in the direct testimony of AmerenUE witness Shawn E. Schukar. If a unit is bid in real time (i.e. it is bid in that day) it must also produce to its bid commitment or additional MISO charges will apply. Consequently, while being in the MISO market gives the AmerenUE load access to greater generating resources, it also suggests the need for an increased level of generation reliability and availability to meet AmerenUE's obligations to MISO and minimize additional fees. Increasing generation reliability and availability could also create opportunities for AmerenUE to sell more energy, principally during off-peak periods, into the MISO market.

Q. Discussed above were capacity additions totaling approximately 434 MW at existing AmerenUE generating plants. Please describe the other capacity additions that have been made on the AmerenUE system.

A. Below is a table showing new generation additions since January 1, 2002, with the exception of three new combustion turbine generating units purchased in the first quarter of 2006, which will be discussed in detail in the direct testimony of AmerenUE witness Michael Moehn.

	Venice CTG #2	Venice CTG #3 & #4	Venice CTG #5	Peno Creek 1 - 4	Kinmundy 1 - 2	Pinckneyville 1 - 4	Pinckneyville 5 - 8
CTG Manufacturer	P&W FT-8	SWPC 501FD	SWPC 501D5A	P&W FT-8	SWPC 501D5A	GE LM 6000	GE 6B
# of units	1	2	1	4	2	4	4
Commerical Operation Date	6/1/02	6/1/05	11/1/05	05/19/02 (1 - 3), 5/26/02 (4)	4/10/01 (1) 5/25/01 (2)	06/01/00 (1&2) 6/20/00 (3) 6/30/00 (4)	6-14-00 (5&6) 6/23/01 and 7/03/01 for units 7 & 8
Summer Net Capabilitiy Rating/Unit (MW)	48	168 /unit	116 /unit	47 /unit	116 /unit	44 /unit	36 /unit
Summer Net Capabilitiy Rating/Set (MW)	48	336	116	188	232	176	144
Installed Cost ($mil)	$ 26,940,328	$ 119,578,942	$ 42,680,863	$ 107,161,523	$ 101,645,395	$ 102,414,131	$ 67,281,191
Cost/kw ($)	561	356	368	570	438	582	467

Q. Describe AmerenUE's need for additional capacity beginning on January 1, 2002.

A. AmerenUE last added a baseload plant in 1984. Load growth, retirement of the Venice steam plant, and changes in AmerenUE's capacity sales and purchases contracts all contributed to the need to add approximately 700 MW of capacity at AmerenUE in summer 2002. The additional needed capacity additions were phased in from 2002 through 2005 as reflected in the table above. In addition, capacity requirements were impacted by the transfer of AmerenUE's former Metro East (Illinois) service territory to AmerenCIPS and by the addition of Noranda Aluminum, Inc. as a retail customer.

Q. How did AmerenUE determine that peaking capacity is the least cost resource option to add?

A. Ameren Services Company's Corporate Planning Department continuously analyzes the least cost generation resource options for AmerenUE. AmerenUE's integrated resource plan (IRP) filing in the 1990's supported the installation of CTGs given the fact that AmerenUE needed to increase its capacity, but did not have a need for additional energy. Subsequent studies up to and including AmerenUE's December 2005 IRP filing also indicated that the installation of CTGs through at least 2010 is both the least cost and least risk option for AmerenUE across a robust range of future scenarios. Consequently, AmerenUE has continued to add CTGs as its capacity needs have continued to increase.

Q. There is a lot of discussion in the industry about the high cost of natural gas and concerns have arisen in Missouri about reliance on gas-fired generation. Are those concerns an issue relating to AmerenUE's addition of a large quantity of gas-fired CTG capacity over the last few years?

A. No. AmerenUE has added the CTGs to provide it with capacity needed only at those important, though infrequent, times when the loads on the AmerenUE system hit their peak, notably on the very hottest days each summer. Even with the addition of these CTGs, a high percentage of the energy produced by AmerenUE will continue to be produced from AmerenUE's baseload generating units. On average, it is expected that AmerenUE's CTG fleet will run only a small percentage of the time over the next few years. In modeling the various options for adding the capacity needed to meet AmerenUE's peak needs and to maintain a prudent level of reserves, the addition of these gas-fired CTGs has continued to be the least cost option.

VI. ELECTRIC GENERATION ENVIRONMENTAL PROJECTS

Q. Have environmental regulations changed since AmerenUE's last rate proceeding?

A. Yes. AmerenUE must comply with several new federal environmental regulations, including the Clean Air Interstate Rule (CAIR), published in the Federal Register on May 12, 2005, the Clean Air Mercury Rule (CAMR), published in the Federal Register on May 18, 2005, the Missouri NOx SIP (State Implementation Plan) Call, PM2.5 Standards, Ozone Standards, and Regional Haze Rules.

Q. Please explain CAIR.

A. CAIR affects 28 Eastern and Midwestern states and the District of Columbia. It is a regional cap and trade program. It requires NOx and SO_2 emission reductions for PM2.5 and 8-hour ozone NAAQS (National Ambient Air Quality Standards) compliance in downwind areas. It requires emission reductions in two phases: NOx in 2009 and 2015; SO_2 in 2010 and 2015. It calls for the reduction of power plant SO_2 emissions of 50% in 2010 and 67% starting in 2015. It begins an annual NOx reduction program in 2009 with NOx emission reductions of 70% starting in 2015. The states are required to develop their implementation plans by September 2006. AmerenUE estimates its NOx and SO_2 reductions to comply in 2015 will be approximately 34% and 72% respectively.

Q. What is CAMR?

A. CAMR is a national mercury cap and trade program. There are separate programs for new (construction starting on or after January 30, 2004) and existing coal-fired units. New Source Performance Standard (NSPS) will apply for new units on an output basis (lb./MWh) in addition to being subject to a cap. Existing units will receive allowance

allocations in ounces. Phase 1 will begin in 2010 with a national cap of 38 tons per year. Most reductions are intended to be achieved from co-benefits from the installation of scrubbers. Phase 2 will begin in 2018 with a national cap of 15 tons per year. This cap is a 70% reduction from actual 1999 emissions. The states must finalize regulations by November 2006. State participation in the trading program is optional. AmerenUE's estimated mercury reductions for Phases 1 and 2 are 52% and 81% respectively.

Q. You also cited the Missouri NOx SIP Call. Please explain this program.

A. The Missouri NOx SIP Call has an effective date of May 1, 2007. It applies to the ozone period which is defined to be May 1st through September 30th of each year. The Missouri Air Conservation Commission approved the rule on May 26, 2005 and submitted it to the U.S Environmental Protection Agency for final approval. This rule will bring the eastern third of Missouri into the NOx control program currently in effect in most of the Eastern United States.

Q. Are there other recent noteworthy changes in environmental requirements affecting AmerenUE's generating units?

A. Yes. There are new fine particulate standards, ozone standards, and a new regional haze rule.

Q. Please summarize these other requirements.

A. The fine particulate or PM (particulate matter) 2.5 standards are designed to reduce fine particulates on a 24-hour and annual basis. Nonattainment areas were designated on April 5, 2005. Designated areas included Metro East and the Chicago areas in Illinois and the St. Louis area in Missouri. State Implementation Plans are due April 2008. The rule will target additional reductions in annual NOx and SO_2 emissions.

The ozone standard is designed to reduce ozone on an 8-hour basis. Nonattainment areas were designated on June 14, 2004. Designated areas are the Metro East and the Chicago area in Illinois and the St. Louis region in Missouri. State Implementation Plans are due in June 2007. The rule will target additional reductions in ozone season NOx emissions.

The Regional Haze Rule's purpose is to improve visibility in national parks and wilderness areas. Areas of local interest include Hercules Glades and Mingo wilderness areas in Missouri and the Upper Buffalo River in Arkansas. Missouri is participating in the Central Regional Air Planning Organization which is one of five regional planning organizations (RPO) established. These RPO's will determine the requirements for emission controls known as Best Available Retrofit Technology (BART). AmerenUE sources which are BART eligible under the rule are Labadie Unit Nos. 1-4, Rush Island Unit Nos. 1-2 and Sioux Unit Nos. 1-2. State implementation plans for BART controls are due in April 2008. The rules will target reductions in NOx, SOx, certain VOC's (volatile organic compounds) and ammonia.

Q. Can you please describe AmerenUE's current plan for meeting these more stringent environmental regulations in the coming years and how these regulations will impact the AmerenUE fossil fleet?

A. Listed below are the current compliance requirements for the AmerenUE fleet:

Regulation	Nitrogen Oxides (NOx) (lbs./Mmbtu)	Sulfur Dioxide (SO_2) (lbs./Mmbtu)	Mercury (Hg)
Current Emissions	0.16	0.80	Under Study
CAIR/CAMR Phase I	.15 by 1/1/09	.60 by 1/1/10	50-60% by 1/1/10
CAIR/CAMR Phase II	.125 by 1/1/15	.35 by 1/1/15	~ 80% by 1/1/18

Notes:

--Hg CEMS (Continuous Emission Monitoring System) required by 1/1/09

--Hg Regulation will be in ounces/year

--NOx and SO2 expressed as equivalent emission rates; regulations will require mass emission caps

Q. What is AmerenUE's compliance strategy?

A. AmerenUE's compliance strategy depends upon many variables, and the key decision drivers relate to the performance that AmerenUE seeks to achieve at its generating units. The following variables are being analyzed to help formulate the best overall plan:

- SO_2 emissions levels from the coal being delivered to the plant;
- The continually changing value of emissions allowances;
- The need for fuel diversity to help mitigate some uncertainty in fuel costs (ability to burn Powder River Basin (Wyoming) and Illinois coals at certain plants);
- Current and future technology availability and flexibility;
- Capital and O&M costs and total cost of ownership of various environmental technologies and equipment;
- Generating unit configuration (size, type of boiler, etc); and
- Least cost economic analyses.

The current base environmental compliance plan provides for SO_2 compliance and allows for fuel flexibility through the installation of wet scrubbers at the Sioux Plant on Unit Nos. 1 and 2. These scrubbers are currently expected to be installed within the next five years. Options regarding the Rush Island and Labadie Plants remain under evaluation at this time.

NOx reduction projects will also be performed on Sioux Unit Nos. 1 and 2 and at Meramec Unit No. 3 prior to the 2007 ozone season to meet the Missouri NOx SIP Call regulations. AmerenUE plans to install NOx reduction systems (RRI/SNCR (Rich Reagent Injection/Selective Non-Catalytic Reduction)) on both Sioux Units and install a NOx reduction system (low NOx burners/over-fired air (OFA)) on Meramec Unit No. 3, which is similar to the systems installed on the other three Meramec units. As noted above, these projects are to be completed by 2007 at an estimated cost of $12 million and $7 million respectively. We anticipate that ongoing O&M expenditures associated with the RRI/SNCR improvements at the Sioux Plant will increase by approximately $4 - $5 million per year for ozone season operation, May through September.

With respect to the wet scrubbers to be installed at the Sioux Plant, AmerenUE presently expects an increase of $6 million per year per unit (for a total of $12 million per year), bringing the total increase in expected O&M costs relating to the above-described environmental improvements at the Sioux Plant to approximately $16 million per year. In addition to these increased O&M costs, the scrubbers will also result in a loss of some capacity due to the energy needed to operate the scrubbers. The Meramec Plant will not incur any significant increase in O&M cost due to the operation of its NOx control equipment. These systems will also add complexity and operational restrictions that will

potentially lower overall plant availability and limit flexibility, thus increasing overall generating costs. AmerenUE continues to study these possible operational restrictions and cannot at this time fully quantify their effect on overall generating costs.

With respect to compliance with mercury reduction requirements, AmerenUE is currently evaluating future mercury compliance requirements and is weighing its options regarding a long-term strategy. As technologies continue to improve, it is AmerenUE's belief that more efficient mercury removal processes will be perfected prior to the required mercury reduction requirements which take effect in 2010. Current estimates of capital investments required for mercury monitoring and control are expected to be at least $70 million. Annual O&M costs for mercury control are currently expected to be at least $40 million per year.

VII. TAUM SAUK UPDATE

Q. Please provide a brief summary of the upper reservoir failure at the Taum Sauk pumped storage facility in Reynolds County, Missouri.

A. As the Commission is aware, on December 14, 2005, the upper reservoir of our Taum Sauk power plant experienced a major failure. The failure resulted in a rupture in the northwest corner of the upper reservoir, releasing approximately 1.5 billion gallons of water which rushed down the side of Proffit Mountain and through Johnson's Shut-Ins State Park. Thankfully, there was no loss of life from this event.

Forensic root cause reports were developed following the event by three entities. Those entities were Rizzo Associates (an engineering group with dam expertise hired by AmerenUE), a project team consisting of Federal Energy Regulatory Commission (FERC) engineers familiar with dam safety issues, and a FERC Independent Panel of

Consultants (a panel of 3 independent dam design engineers hired by FERC). These groups independently collected physical evidence at the plant and conducted discussions with knowledgeable AmerenUE employees and employees of Ameren Services Company working on behalf of AmerenUE, as well as others connected to the event. They also reviewed volumes of information ranging from initial construction reports to post-event operating data. All three forensic reports pointed out that there were many factors, some dating back to the original construction of the upper reservoir 45 years ago, that contributed to the failure.

The primary root causes of the event, as provided for in the FERC Independent Panel report were

- "The pressure transducers that monitored reservoir water levels became unattached from their supports causing erroneous water level readings.
- The emergency backup level probes were set at an elevation above the lowest points along the parapet wall; thus, they failed their protection role because this enabled overtopping to occur before the probes could trigger shutdown.
- The normal operating water levels of 1 ft. below the top of the parapet wall was too near the top of the wall to allow for any mistakes of mis-operation.
- Visual monitoring of the upper reservoir water levels was almost non-existent and there was no systematic 'ground-proofing' recorded of the relationship to the top of the wall and the associated water levels actually being achieved.

- There was no overflow spillway to safely carry accidental over-pumped water downstream and below the dam."

(Report of FERC Independent Panel of Consultants, pp. 35-36)

The FERC Independent Panel's report also listed a secondary root cause as the marginally stable, dumped "dirty" rockfill embankment and associated parapet wall atop the dam, which constituted an unforgiving containment structure. (p. 36) In other words, this type of construction and fill material didn't leave any room for error should an overtopping occur.

The Rizzo Associates and the FERC Project team reports generally agreed with the conclusions drawn by the FERC Independent Panel.

Q. What steps are being taken by AmerenUE in response to these reports?

A. Now that all of the forensic reports associated with the breach have been completed and submitted to FERC, AmerenUE is in the process of taking this information and using it to develop a corrective action plan to ensure that the series of failures experienced at Taum Sauk will not happen at any AmerenUE facility. Outlined below are key steps being undertaken by AmerenUE:

- First, AmerenUE has created a Dam Safety Program led by a highly experienced civil engineer as Chief Dam Safety Engineer. This program will include development of an updated dam inspection plan and implementation of site-specific safety and instrumentation training. AmerenUE will use this program, under the direction of the Chief Dam Safety Engineer, at all of its hydroelectric facilities (Taum Sauk, Osage (Bagnell Dam), and the Keokuk Run of River Plant). This program will be

charged with monitoring operations to ensure AmerenUE is following safe practices and procedures not only at hydroelectric facilities, but at all our plants with dam related facilities.

- Next, AmerenUE has established a non-nuclear quality assurance team to review engineering plans and operating procedures and to look at best practices and processes and implement recommended changes.
- Third, AmerenUE has engaged outside consultants to examine the operating safety of all our hydroelectric facilities and to extensively analyze AmerenUE's current policies and procedures. This information will be utilized as part of the Dam Safety Program discussed above.
- AmerenUE has also re-examined the safety procedures at all of our facilities, including our emergency action plans. Moreover, we are currently analyzing the training of all employees in critical positions to insure they fully understand the signs of possible plant failure.

Q. Do you have any other comments relating to the Taum Sauk event at this time?

A. Only that I want to assure the Commission that AmerenUE has taken and is continuing to take multiple, proactive steps to identify potential risks at all plants and to establish and implement action plans to minimize risks associated with plant failures. The Taum Sauk reservoir failure was caused by a number of factors – many dating back to the original construction of the upper reservoir. What occurred was a complicated series of events. Having said that, we are doing our absolute best to learn from this experience. As we have said from the very beginning – from the date of this event on December 14, 2005,

we accept responsibility for the effects of the Taum Sauk breach and are doing what is necessary to restore the damage done to the surrounding area as a result of the failure. We have made and are continuing to make progress in our efforts to restore Johnson's Shut-Ins. In fact, the park was re-opened, for limited use, during the Memorial Day weekend. We are also continuing to work with the businesses in the area that may sustain losses from this event. Finally, we have resolved all claims with the family most significantly impacted by this tragic event.

I also want to reiterate that even though our investigation shows that everyone involved in this incident was well-intentioned, we recognize that the consequences of the failure were substantial. I do believe that at every step of the way our employees took actions they believed were sufficient to protect the facility's safety and the safety of the public, though in hindsight those steps clearly proved inadequate. That is why we are working very hard to take all necessary steps to prevent any similar accident in the future.

Q. Will the Taum Sauk Plant be rebuilt?

A. No final decision has yet been made. In the next few months we will continue to evaluate options associated with a possible rebuild of the Taum Sauk Plant. Although we have not made a final decision on rebuilding we have begun the design process for restoration of the Taum Sauk upper reservoir. A Board of Consultants appointed by AmerenUE (a group of 4 independent dam design engineers) and Rizzo Associates are working on the preliminary designs associated with a new upper reservoir to be submitted to FERC for its approval. If rebuilt, this new reservoir would occupy essentially the same footprint and contain essentially the same volume of water and the overall plant generating capacity would not change. If we ultimately decide to rebuild, we anticipate construction

work would begin early in 2007 with the plant being available for service by the summer of 2009.

VIII. SUMMARY

Q. Please summarize your testimony.

A. AmerenUE has made and continues to make significant investments in its existing generating fleet as required to reliably supply the needs of Missouri customers. Capacity has been added to existing plants and new capacity has been procured by the acquisition of reliable gas-fired generation located in close proximity to native load customers. These capacity additions have pushed back the need for new baseload generation while improving the overall reliability of the AmerenUE system. Programs such as PRO/PMO and CAP, as well as continued performance monitoring and enhanced operational training, should continue to increase the performance of our units and improve overall reliability.

Future environmental regulations will present significant operational and financial challenges that must be met with sound planning, good construction, and effective operating practices. AmerenUE has proven in the past that innovative thinking and sound judgment have provided the base for industry-leading performance in environmental compliance and the development of cost effective solutions that benefit our Missouri customers and allow us to meet their future demand for electricity.

The continued investments in our generating fleet, including the substantial environmental-related investments and associated O&M costs, will continue to present challenges to AmerenUE and its stakeholders. Consequently, it is important that all stakeholder needs be balanced while providing AmerenUE with the necessary financial

resources to continue to deliver some of the best performance in the industry at extremely low comparative rates.

Q. Does this conclude your direct testimony?

A. Yes, it does.

BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF MISSOURI

In the Matter of Union Electric Company d/b/a AmerenUE for Authority to File Tariffs Increasing Rates for Electric Service Provided to Customers in the Company's Missouri Service Area.	)))))	Case No. ER-2007-0002

AFFIDAVIT OF MARK C. BIRK

STATE OF MISSOURI)
) **ss**
CITY OF ST. LOUIS)

Mark C. Birk, being first duly sworn on his oath, states:

1. My name is Mark C. Birk. I am employed by AmerenUE as Vice President of Power Operations.

2. Attached hereto and made a part hereof for all purposes is my Direct Testimony on behalf of Union Electric Company, d/b/a AmerenUE, consisting of 28 pages, Attachment A and Schedule MCB-1, all of which have been prepared in written form for introduction into evidence in the above-referenced docket.

3. I hereby swear and affirm that my answers contained in the attached testimony to the questions therein propounded are true and correct.

Mark C. Birk

Subscribed and sworn to before me this 5h day of July, 2006.

Notary Public

My commission expires: May 19, 2008

CAROLYN J. WOODSTOCK
Notary Public - Notary Seal
STATE OF MISSOURI
Franklin County
My Commission Expires: May 19, 2008

EXECUTIVE SUMMARY

Mark C. Birk

Vice President of Power Operations

*** * * * * * * * * ***

The purpose of my direct testimony is to explain AmerenUE's ongoing investments in its electric generation infrastructure and to provide a brief summary of the upper reservoir failure at the Taum Sauk pumped-storage facility and an update on related matters. The following are the principal points of my testimony:

(1) From January 1, 2002 through March 31, 2006, AmerenUE spent more than $1.7 billion on generating infrastructure. More than $1.3 billion was spent on AmerenUE's non-Callaway generating assets, including the addition of several new combustion turbine generating units. Approximately $638 million of investments have been placed in service since January 1, 2002 at the Company's coal-fired and hydroelectric units alone. From January 1, 2002 through December 31, 2006, the capacity of AmerenUE's generating assets (excluding the addition of peaking units) has also been increased by approximately 434 megawatts (MW). Over that same period, AmerenUE has also increased the "Equivalent Availability" (i.e. the percentage of time an electric power generating unit was available for service during a period) of its coal-fired and hydroelectric units by approximately 10%. These investments have also allowed a substantial increase in the production of electricity on a megawatt-hour (MWh) basis from the Company's coal-fired and hydroelectric plants as evidenced by the 22% increase from 2002 to 2005, from 36.3 million MWhs in 2002 to 44.2 million MWhs in 2005.

(2) AmerenUE's ongoing operations and maintenance (O&M) expenditures are escalating due to several factors, including the aging of AmerenUE's fleet (the average fossil unit age is 39 years), continuing increases in raw material and outside services costs, increasing environmental expenses, and increasing capacity factors, particularly at AmerenUE's baseload plants. Capacity factors are increasing because electric loads continue to increase while no new baseload generation has been brought on line since 1984. Through the use of initiatives such as AmerenUE's Plant Reliability Optimization, Plant Maintenance Optimization, and Corrective Action Programs, and other operational performance improvements with respect to its generating fleet, AmerenUE has been able to meet the ever increasing electrical energy needs of Missouri customers in an economic manner.

(3) There is a definite need for additional generation capacity in Missouri and throughout the nation in order to maintain the reliability of the electric power supply. As the 2003 blackout in the Northeast showed, local generation close to the load provides for the most secure and reliable way to supply electricity. AmerenUE has continued to invest in new generation, as needed, to meet its increased needs for capacity. Over the past approximately four-year period, AmerenUE has invested more than $700 million in additional peaking capacity needed both to meet its peak needs and to maintain a prudent level of operating reserves.

(4) AmerenUE will be required to make significant environmental capital investments and incur associated O&M costs to meet the requirements of existing, updated, and new environmental regulations, including the Clean Air Interstate Rule (CAIR), the Clean Air Mercury Rule (CAMR), and the Missouri NOx SIP (State Implementation Plan) Call. These environmental capital investments and increased ongoing O&M costs

necessitated by those regulations will present significant financial and operational challenges and risks while overall emissions are being reduced.

(5) Three different entities, Rizzo Associates (an engineering group with dam expertise hired by AmerenUE), a project team consisting of Federal Energy Regulatory Commission (FERC) engineers familiar with dam safety issues, and a FERC Independent Panel of Consultants (a panel of 3 independent dam design engineers hired by FERC) have investigated the cause of the Taum Sauk upper reservoir failure which occurred on December 14, 2005. They all generally agree on the root causes of the failure, some of which date back to the plant's original construction in the early 1960s. We are thankful that there was no loss of life from this event and are working diligently to use what has been learned from these investigations to develop a corrective action plan to ensure that a similar event does not happen again. Though our investigation shows that everyone involved in this incident was well-intentioned, we recognize that the consequences of the failure were substantial. At every step of the way our employees took actions they believed were sufficient to protect the facility's safety and the safety of the public, though in hindsight, those steps clearly proved to be inadequate. We are working very hard to take all necessary steps to prevent any similar accident in the future. No final decision on whether the Taum Sauk Plant will be rebuilt has yet been made, but over the next few months we will continue to evaluate options for a possible rebuild of the Taum Sauk Plant. We have asked consultants to begin work on preliminary designs associated with a new upper reservoir and would expect, if a decision is ultimately made to rebuild the plant, that it could be available for service by the summer of 2009.

AmerenUE
QUARTERLY REPORT ON INFRASTRUCTURE EXPENDITURES
PER JOINT STIPULATION AND AGREEMENT IN MPSC CASE NO. EC-2002-1
LIFE TO DATE JANUARY 1, 2002 THROUGH MARCH 31, 2006

	EXPENDITURES
Item 1. 700 MW of new regulated generating capacity.	
12483 - PENO CREEK CTG UNIT #1	$13,569,079
12484 - PENO CREEK CTG UNIT #2	6,890,851
12485 - PENO CREEK CTG UNIT #3	7,972,098
12486 - PENO CREEK CTG UNIT #4	6,811,776
TRANSFER OF PINCKNEYVILLE AND KINMUNDY CTGs	237,134,928
PURCHASED AUDRAIN CTG	115,000,000
PURCASED GOOSE CREEK AND RACCOON CREEK CTGs	175,000,000
TOTAL ITEM 1.	$562,378,732
Item 2. Upgrades to existing plants of 270 MW or greater additional generating capacity.	
Keokuk	
11107 - KEOKUK-REPLACE UNIT #11 & 13 TURBINE RUNNER	2,736,071
11108 - KEOKUK-REPLACE UNIT #10 & 12 TURBINE RUNNER	4,791,439
11109 - KEOKUK-REPLACE UNIT #8 & 9 TURBINE RUNNER	4,929,221
13395 - KEOKUK-REPLACE UNIT #7 TURBINE RUNNER	3,709,744
TOTAL	16,166,475
Labadie	
10803 - LABADIE 1 HP/IP TURBINE REPLACEMENT	11,326,997
11820 - LABADIE U4-HP/IP TURBINE RETROFIT	6,088,598
12527 - LABADIE 4A & 4B AIR PREHEATER ROTOR REPLACEMENT	3,935,708
12528 - LABADIE - 3A & 3B AIR PREHEATER REPLACEMENT	4,369,171
12687 - LABADIE UNIT 3 - HP/IP TURBINE RETROFIT	9,085,082
13302 - LABADIE UNIT 3 LP TURBINE RETROFIT-REPLACEMENT	14,080,406
13303 - LABADIE UNIT 4 LP TURBINE RETROFIT-REPLACEMENT	11,698,087
TOTAL	60,584,049
Meramec	
11645 - MERAMEC U1 COLD END AIR HEATER REPLACEMENT	9,896,530
12917-MERAMEC 3 FURNACE REPLACEMENT	-
13421 - MERAMEC UNIT 4 LP TURBINE RETROFIT-REPLACEMENT	19,310,862
13677 - MERAMEC UNIT 1 HP & IPLP TURBINE UPGRADE	-
13680 - MERAMEC UNIT 2 HP & IPLP TURBINE UPGRADE	-
13735 - MERAMEC UNIT 4 HP & IP TURBINE UPGRADE	-
13733 - MERAMEC UNIT 3 LP TURBINE UPGRADE	-
TOTAL	29,207,392
Osage	
10847 - OSAGE - CAPACITY UPGRADE OF 4 UNITS	4,260,369
Rush Island	
10787 - RUSH ISLAND 1 HP/IP TURBINE REPACEMENT	1,287,952
10804 - RUSH ISLAND 2 HP/IP TURBINE REPLACEMENT	16,274,688
11112 - RUSH ISLAND U1 SUPERHEAT REAR PENDANT REPLACEMENT	(304,750)
12947 - RUSH ISLAND U2 SUPERHEAT REAR PENDANT REPLACEMENT	5,983,410
TOTAL	23,241,300

Item 2 Upgrades to existing plants of 270 MW or greater additional generation capacity. (Continued)

	EXPENDITURES
Sioux	
11515 - Sioux Unit 1 Cyclone Replacement	268,728
11940 - SIOUX UNIT 1 HP/IP TURBINE REPLACEMENT	12,022,653
11941 - SIOUX UNIT 2 HP/IP TURBINE REPLACEMENT	12,031,083
13561 - Sioux Unit 2 Cyclone Replacement	-
TOTAL	24,322,464
Callaway	
11234 - Turbine Rotor Replacement	56,034,414
TOTAL ITEM 2.	213,816,463

Item 3. Replacement of Steam Generators at the Callaway Power Plant.

12636 - STEAM GENERATOR REPLACEMENT	149,306,577
12821 - BACKFILL UNIT 2 EXCAVATION	878,925
12828 - SGRP SUPPORT FACILITY	2,574,195
12829 - DOCKING FACILITY	3,717,991
12830 - SECURITY UPGRADE	1,461,152
TOTAL ITEM 3.	157,938,840

Item 4. Replacement of Venice power plant by new generating capacity.

Venice	
10887 - VENICE PLANT UNIT #3 SIMPLE CYCLE CTG	59,159,054
10888 - VENICE PLANT UNITS #2 & #4 SIMPLE CYCLE CTG	57,182,848
11439 - VENICE CTG #2	8,558,878
14115 - VENICE CTG #5	42,048,169
TOTAL ITEM 4.	166,948,949

Item 5. New transmission lines and transmission upgrades that will increase transmission import capability by 1,300 MW.

12637 - DUPO AREA SUBSTATION - NEW 345-138 KV SUB	744,643
12714 - CAHOKIA-DUPO 345 KV TRANSMISSION LINE	244,078
12737 - CAHOKIA - N. COULTERVILLE - REMOVE SAG LIMIT	958
12744 - CAMPELL-MALINE 1&2 138KV RECONDUCTOR	1,489,058
12819 - CAHOKIA-MERAMEC 1&2 REBUILD CAHOKIA TO LEMAY TAP	2,132,399
12839 - SIOUX-ROXFORD 1&2 RECONDUCTOR 138KV LINE - MISS. TAP-ROXFORD	1,091,806
12892 - CAHOKIA SUB - UPGRADE 345KV TRANSFORMER #9 POSITION	2,026,900
12903 - CAHOKIA SUB - 345 KV C-DUPO AREA TERMINAL	-
12941 - CAHOKIA SUB - UPGRADE 230 KV C-N. COULTER TERMINAL	-
12899 - CAHOKIA SUB - UPGRADE C - MERAMEC 1&2 TERMINALS	38,908
13477 - MALINE SUB - REPLACE POSITION F BREAKER	159,775
13935 - LEMAY - RELAY UPGRADE DUPO-LEMAY LINE	-
13938 - MERAMEC - RELAY UPGRADE MERAMEC-DUPO 1&2 LINES	-
13939 - WATSON - RELAY UPGRADE DUPO-WATSON LINE	-
TOTAL ITEM 5.	7,928,525
TOTAL ITEMS 1 THROUGH 5	$ 1,109,011,509
GRAND TOTAL AMERENUE INFRASTRUCTURE EXPENDITURES	$ 2,654,618,002