

Exhibit No.  
Issues: Riverton Unit 12 In-Service;  
Asbury SCR In-Service; Energy Supply  
Operating & Maintenance Expense; FAC  
Supporting Information  
Witness: Blake A. Mertens  
Type of Exhibit: Direct Testimony  
Sponsoring Party: Empire District Electric  
Case No.:

**Before the Public Service Commission  
of the State of Missouri**

**Direct Testimony**

**Of**

**Blake A. Mertens**

**October 2007**

**\*\*Denotes Highly Confidential\*\***

**NP**

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OF  
BLAKE A. MERTENS  
ON BEHALF OF  
THE EMPIRE DISTRICT ELECTRIC COMPANY  
BEFORE THE  
MISSOURI PUBLIC SERVICE COMMISSION

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DIRECT TESTIMONY  
OF  
BLAKE A. MERTENS  
ON BEHALF OF  
THE EMPIRE DISTRICT ELECTRIC COMPANY  
BEFORE THE  
MISSOURI PUBLIC SERVICE COMMISSION  
CASE NO.

1 **INTRODUCTION**

2 **Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.**

3 A. Blake A. Mertens. My business address is 602 Joplin St., Joplin, Missouri.

4 **Q. BY WHOM ARE YOU EMPLOYED AND IN WHAT CAPACITY?**

5 A. The Empire District Electric Company (“Empire” or “Company”), I am Manager of  
6 Strategic Projects.

7 **Q. PLEASE DESCRIBE YOUR EDUCATIONAL BACKGROUND.**

8 A. I graduated from Kansas State University in 2000 with a Bachelor of Science  
9 Degree in Chemical Engineering with a minor in Business. I am currently pursuing  
10 a Masters degree in Business Administration at Missouri State University.

11 **Q. PLEASE GIVE AN OVERVIEW OF YOUR PROFESSIONAL**  
12 **EXPERIENCE.**

13 A. I was employed by Black & Veatch Corp. immediately following my graduation  
14 from Kansas State University in May of 2000. From June of 2000 through  
15 November of 2001, I held roles as a technical analyst and energy consultant for the  
16 Strategic Planning Group of Black & Veatch’s Power Sector Advisory Services in  
17 the Energy Services Division. Duties included assisting in power plant siting  
18 studies, economic analysis of potential power plants using production cost

1 modeling, independent engineering evaluations of plant assets, and market analysis  
2 of the California energy crisis of 2000 – 2001. I went to work for Empire in  
3 November of 2001 as a Staff Engineer in Energy Supply where my duties included  
4 tracking of plant capital and operating & maintenance (“O&M”) expenses,  
5 involvement in energy supply regulatory issues, evaluation of new generating  
6 resource options, assisting in the construction of new plant, and assisting in the  
7 modeling and tracking of fuel and purchased power costs. In 2003, my title was  
8 changed to Planning Engineer with similar duties but more responsibilities in the  
9 area of generation planning. In the fall of 2004 I took a position as Combustion  
10 Turbine Construction Project Manager. In this position I was responsible for the  
11 construction and commissioning of a 150 MW combustion turbine at Empire’s  
12 Riverton Power Plant known as Riverton Unit 12. Riverton Unit 12 went into  
13 commercial operation in April of 2007. Finally, in the fall of 2006 I took on my  
14 current position as Manager of Strategic Projects. In this role I am responsible for  
15 the management of new generation and major projects for Energy Supply facilities.  
16 This includes representing Empire's interests at the Iatan, Plum Point and other off-  
17 system generation facilities.

18 **EXECUTIVE SUMMARY**

19 **Q. WHAT IS THE PURPOSE OF YOUR DIRECT TESTIMONY IN THIS**  
20 **CASE BEFORE THE MISSOURI PUBLIC SERVICE COMMISSION**  
21 **(“COMMISSION”)?**

22 A. My Direct Testimony will cover various topics related to Empire’s generating units.  
23 In the first two sections of my testimony I will discuss new assets added to

1 Empire's generation fleet. Specifically, the proposed in-service criteria for  
2 Riverton Unit 12, which went into commercial operation this past spring, and for  
3 the Asbury SCR, which is scheduled to be operational late this fall, will be detailed.  
4 In the following section of my testimony I will detail proposed adjustments to  
5 Empire's test year level of operating and maintenance expense as they relate to  
6 generating assets. These adjustments total \$3,247,913, a significant portion of  
7 which is related to the new asset additions discussed above. Finally, the last section  
8 of my testimony will provide information to support Empire's filing for a fuel  
9 adjustment clause as part of this case.

10 **RIVERTON UNIT 12 IN-SERVICE CRITERIA**

11 **Q. PLEASE BRIEFLY EXPLAIN THE RIVERTON UNIT 12 ADDITION.**

12 A. In July of 2003 it was determined that in order for Empire to economically meet the  
13 continually growing capacity and energy needs of its customers and service  
14 territory, additional combustion turbine generating capacity would be needed by the  
15 summer of 2007. Over the next year Empire evaluated several different sites and  
16 combustion turbine technologies and manufacturers to determine how to most  
17 economically meet this need. In the fall of 2004 Empire determined the Riverton  
18 Power Plant and a Siemens V84.3A2 combustion turbine would be the site and  
19 combustion turbine of choice. During 2005 site preparation activities took place,  
20 leading to construction of the combustion turbine and balance of plant facilities in  
21 2006, and commissioning of the unit in 2007. On April 10, 2007 Empire declared  
22 Riverton Unit 12 available for commercial operation. This project was

1 contemplated by our Experimental Regulatory Plan approved by the Commission in  
2 Case No. EO-2005-0263.

3 **Q. DO YOU HAVE PROPOSED IN-SERVICE CRITERIA FOR RIVERTON**  
4 **UNIT 12?**

5 A. Yes, I do. Empire worked with the Commission Staff (“Staff”) to develop the  
6 following in-service criteria that would be utilized for Riverton Unit 12:

- 7 1. All major construction work is complete.
- 8 2. All preoperational tests have been successfully completed.
- 9 3. Unit successfully meets all contract operational guarantees.
- 10 4. Unit successfully demonstrates its ability to initiate the proper start sequence  
11 resulting in the unit operating from zero (0) rpm (or turning gear) to full load  
12 when prompted at a location (or locations) from which it is normally operated.
- 13 5. If unit has fast start capability, the unit demonstrates its ability to meet the fast  
14 start capability.
- 15 6. Unit successfully demonstrates its ability to initiate the proper shutdown  
16 sequence from full load resulting in zero (0) rpm (or turning gear) when  
17 prompted at a location (or locations) from which it is normally operated.
- 18 7. Unit successfully demonstrates its ability to operate at minimum load for one  
19 (1) hour.
- 20 8. Unit successfully demonstrates its ability to operate at or above 95% of  
21 nominal capacity for 4 continuous hours.
- 22 9. Unit successfully demonstrates its ability to produce an amount of energy  
23 (MWhr) within a 72 hour period that results in a capacity factor of at least

1           50% during the period when calculated by the formula: capacity factor =  
2           (MWhrs generated in 72 hours) / (nominal capacity x 72 hours).

3       10. Sufficient transmission interconnection facilities shall exist for the total plant  
4           design net electrical capacity at the time the unit is declared fully operational  
5           and used for service.

6       11. Sufficient transmission facilities shall exist for the total plant design net  
7           electrical capacity from the generating station into the utility service territory  
8           at the time the unit is declared fully operational and used for service.

9       It is my understanding that these in-service criteria, deemed “Combustion Turbine  
10       Unit In-Service Test Criteria (Nameplate Capacity of  $\geq 95$  MW)”, are commonly  
11       used by other Missouri regulated utilities as in-service criteria for similar  
12       combustion turbines. These criteria are also included as a part of Empire’s  
13       approved Experimental Regulatory Plan.

14   **Q. HAS RIVERTON UNIT 12 MET EACH OF THE IN-SERVICE**  
15   **CRITERION?**

16   A. Yes. Supporting documentation of such was supplied to the Staff on July 17<sup>th</sup> of  
17       this year. While the Staff has requested additional details surrounding some of the  
18       supporting documentation, to date the Staff has not disputed that the in-service  
19       criteria has been met.

20   **Q. HAS RIVERTON UNIT 12 BEEN UTILIZED TO MEET EMPIRE’S**  
21   **CUSTOMER NEEDS DURING THE SUMMER OF 2007?**

22   A. Yes. Through July 31, 2007, Riverton Unit 12 had produced over 32,000  
23       megawatt-hours of energy to assist in meeting the needs of our customers.

1 **ASBURY SELECTIVE CATALYTIC REDUCTION (“SCR”) IN-SERVICE**

2 **Q. PLEASE BRIEFLY EXPLAIN THE CIRCUMSTANCES LEADING TO**  
3 **THE DECISION TO CONSTRUCT THE ASBURY SCR.**

4 A. The EPA issued its final Clean Air Interstate Rule (“CAIR”) on March 10, 2005.  
5 The CAIR governs NO<sub>x</sub> and SO<sub>2</sub> emissions from fossil fueled units greater than 25  
6 megawatts and will affect 28 states, including Missouri, where our Asbury, Energy  
7 Center, State Line and Iatan Plants are located and Arkansas where the future Plum  
8 Point Energy Station will be located.

9 The CAIR is not directed to specific generation units, but instead, requires  
10 the states (including Missouri and Arkansas) to develop State Implementation Plans  
11 (“SIPs”) to comply with specific NO<sub>x</sub> and SO<sub>2</sub> state-wide annual budgets. Missouri  
12 and Arkansas have finalized their respective regulations and have submitted their  
13 SIPs to the EPA for approval; however, until these SIPs are approved by the EPA,  
14 we cannot definitively determine the allowed emissions of NO<sub>x</sub> and SO<sub>2</sub> for the  
15 Asbury, Energy Center, State Line and Iatan Plants in Missouri or the Plum Point  
16 Energy Station in Arkansas.

17 To help meet CAIR NO<sub>x</sub> requirements, we are constructing a SCR at  
18 Asbury. We expect the SCR to be in-service the fourth quarter of 2007. We have  
19 awarded a contract and the SCR is under construction and will be tied into the  
20 existing unit during our scheduled 2007 major outage this fall. Our current cost  
21 estimate for the SCR at Asbury is \$31 million (excluding AFUDC). This project  
22 was also contemplated as part of our Experimental Regulatory Plan approved by the  
23 Commission in Case No. EO-2005-0263.



1 **Q. DO YOU HAVE PROPOSED IN-SERVICE CRITERIA FOR THE ASBURY**  
2 **SCR?**

3 A. Yes. As part of Empire's Experimental Regulatory Plan that was approved by the  
4 Commission the parties agreed that "they will develop and agree to in-service  
5 criteria for the emissions equipment that is to be installed on.....Asbury SCR and  
6 that the equipment will meet the in-service criteria before the costs for the  
7 equipment will be included in Empire's rate base." Empire worked with the Staff to  
8 draft in-service criteria for the Asbury SCR and these criteria were presented to the  
9 other parties during Empire's Integrated Resource Plan meeting that took place on  
10 March 30, 2007. No objections were raised and Empire therefore presents the in-  
11 service criteria as follows:

12 **In-Service Criteria for NO<sub>x</sub> Control Equipment**

- 13 1. All major construction work is complete.
- 14 2. All preoperational tests have been successfully completed.
- 15 3. Equipment successfully meets all operational contract guarantees. The  
16 operational contract guarantees that have been satisfied by the time of Staff's  
17 direct, rebuttal, or surrebuttal testimony filing in the current rate case will be  
18 evaluated by the Staff. Note: This applies to operational contract guarantees  
19 that are not addressed in criteria 4, 5, and 6 (as listed below).
- 20 4. The equipment shall be operational and demonstrate its ability to operate at a  
21 NO<sub>x</sub> reduction efficiency equal to or greater than 83.7% over a continuous  
22 four (4) hour period while the generating unit is operating at or above 95% of  
23 its design load.

1        5.    The equipment shall also demonstrate its ability to operate at a NO<sub>x</sub> reduction  
2            efficiency equal to or greater than 79.2% over a continuous 120-hour period  
3            while the generating unit is operating at or above 80% of its design load.

4        6.    Continuous emission monitoring systems (“CEMS”) are operational and  
5            demonstrate the capability of monitoring the NO<sub>x</sub> emissions to satisfy the  
6            parameters in items (4) and (5) above.

7    **Q.   HAS THE ASBURY SCR MET EACH OF THESE IN-SERVICE**  
8        **CRITERION?**

9    A.   No.   As stated previously, the Asbury SCR is still under construction and is  
10        scheduled to be complete and commissioned during Asbury’s 2007 fall outage. The  
11        SCR is expected to be ready for service in November of this year. Once Empire has  
12        deemed the in-service criteria met it will provide proof of such to Staff and ask for  
13        concurrence. Supplemental testimony verifying that the Asbury SCR has met each  
14        of the in-service criteria will also be provided.

15   **Q.   WILL THE ASBURY SCR BE CONSIDERED PART OF EMPIRE’S RATE**  
16        **BASE IN THIS CASE?**

17   A.   Yes. To the extent the in-service criteria is met, Empire will roll the construction  
18        costs for the Asbury SCR, estimated to be \$31 million excluding AFUDC, into  
19        plant in-service some time late this year so that those costs will be included in the  
20        test year true-up process as part of this case.

**ENERGY SUPPLY OPERATING AND MAINTENANCE ADJUSTMENTS**

**Q. WHAT AREAS OR PLANTS OF ENERGY SUPPLY WILL YOUR TESTIMONY ADDRESS AS IT RELATES TO OPERATING AND MAINTENANCE (“O&M”) EXPENSES?**

A. Energy Supply O&M expenses include operating and maintenance expenses incurred at Empire’s Asbury, Energy Center, Ozark Beach, Riverton, and State Line plants. In addition, Empire’s 12-percent share of O&M expenses incurred at the Kansas City Power & Light operated Iatan plant are included in O&M expenses.

**Q. WHAT WAS THE TEST YEAR’S (TWELVE-MONTHS-ENDING (“TME”) JUNE 30, 2007) LEVEL OF O&M EXPENSES FOR THESE ENERGY SUPPLY FACILITIES, EXCLUDING LABOR?**

A. O&M expenses for TME June 2007 totaled \$9,952,668, which includes 60 percent of State Line Combined Cycle’s (“SLCC’s”) O&M expenses. This unit is jointly owned – Westar owns 40% and Empire owns 60%. Thus, Empire is responsible for approximately 60 percent of the O&M costs at SLCC.

**Q. FOR PURPOSES OF THIS CASE, WERE ANY ADJUSTMENTS MADE TO THE LEVEL OF EXPENSE TO BETTER REPRESENT NORMAL ONGOING O&M EXPENSES IN ENERGY SUPPLY?**

A. Yes. Nine adjustments were made to normalize the level of expense to allow for abnormalities that occurred during the test year and to match O&M related to assets coming into service. These adjustments are summarized in Table 1 below.

1

**Table 1**

<b>Item</b>	<b>Description</b>	<b>Amount</b>
<b>Adjustments for Test Year Abnormalities</b>		
<b>I</b>	Plant Operating Expense Normalization	\$ 315,761
<b>II</b>	Asbury Maintenance Expense	
<b>III</b>	a. Normalization	\$ 592,883
	b. Major Outage Amortization	\$ 188,000
	SLCC Maintenance Normalization	\$ -678,987
<b>IV</b>	Riverton Maintenance Normalization	\$ 448,383
<b>V</b>	Miscellaneous Maintenance Normalization	\$ 553,889
<b>VI</b>	OPSA Catch-up Payment	\$** **
<b>Adjustments for New Assets</b>		
<b>VII</b>	Riverton Unit 12 Maintenance	\$ 100,000
<b>VII</b>	Asbury SCR Operations & Maintenance	\$ 1,292,500
<b>IX</b>	Asbury and Riverton Mercury Analyzer Maintenance and Testing	\$ 284,000
	<b>Total</b>	<b>\$ 3,247,913</b>

2 **I. Plant Operating Expense Amortization**

3 **Q. PLEASE EXPLAIN THE ADJUSTMENT MADE FOR PLANT**  
4 **OPERATING EXPENSE NORMALIZATION.**

5 A. Operating expenses for the Asbury, Energy Center, Riverton, Ozark Beach, SLCC  
6 (60%), and Iatan plants totaled \$2,748,279 for the test year TME June 2007. The  
7 five-year average of plant operating expenses for these facilities totals \$3,064,039  
8 when adjusted for inflation using the Producer Price Index ("PPI") produced by the  
9 *U.S. Department of Labor: Bureau of Labor Statistics*. Empire asserts an  
10 adjustment of \$315,761 is warranted to realize the 5-year average amount (adjusted  
11 for inflation) as this better represents normalized operating levels for the generating  
12 units and normalizes the outage schedule for these units. Please refer to Schedule  
13 BAM-1 for further breakdown of this adjustment.

1        **II. Asbury Maintenance Expense**

2        **Q. PLEASE EXPLAIN THE ADJUSTMENTS MADE FOR ASBURY**  
3        **MAINTENANCE EXPENSE.**

4        A. As shown in Table 1 above, there are two adjustments that need to be made to  
5        reflect Asbury's maintenance expenses. The first is to normalize Asbury's  
6        maintenance expense to reflect normal annual outage durations. In the spring of  
7        2007, Asbury only took a nine day scheduled outage versus its normally scheduled  
8        23 day outage. A shorter outage was taken because Asbury moved its scheduled 5-  
9        year major outage from the spring to the fall to allow for the major outage to take  
10       place at the same time as the SCR tie-in. This results in an adjustment of \$592,883,  
11       which brings Asbury's maintenance expense to the 5-year average level adjusted for  
12       inflation using the PPI (less Asbury major outage amortization).

13                The delay of Asbury's major outage relates to the second adjustment that  
14       needs to be accounted for, which is the amortization of Asbury's 5-year major  
15       outage. The amortization of Asbury's last major outage concluded in November  
16       2006. Asbury's major outage was originally scheduled for the spring of 2007;  
17       however, as stated above, it was decided to be more economical to move the outage  
18       from the spring of 2007 to the fall of 2007 so that the SCR tie-in and the major  
19       outage work could take place at the same time and thus shorten total outage hours  
20       for the unit. Asbury personnel estimate that maintenance expenses in the  
21       upcoming fall major outage falling under the amortization category will total  
22       \$2,225,000 (compared to amortized values of \$2,654,667 and \$2,991,210 for the  
23       1996 and 2001 major outages, respectfully). Amortized over five years, this

1 equates to \$445,000 in annual expense. After subtracting the amount of  
2 amortization already in the test year, \$257,000, an adjustment of \$188,000 to  
3 Asbury's normalized maintenance expenses is required. Please see Schedules  
4 BAM-1 and BAM-2 for further clarification of the calculation of these adjustments.  
5 The actual cost of the outage can be determined during the test year true-up process,  
6 once actual costs are accounted for, and this amount can be adjusted to reflect the  
7 actual cost.

8 **III. State Line Combined Cycle ("SLCC") Maintenance Normalization**

9 **Q. PLEASE EXPLAIN THE ADJUSTMENT MADE FOR SLCC**  
10 **MAINTENANCE NORMALIZATION.**

11 A. In June of 2001 Empire entered into a long term maintenance agreement ("LTP")  
12 for scheduled outage services for the two combustion turbines that are a part of  
13 SLCC (SLCC 2-1 and 2-2). Payments related to this contract are based on the  
14 actual operating characteristics of the unit (equivalent hours and equivalent starts).  
15 In order to normalize these operating characteristics (i.e, normalize outage  
16 schedules) and thus normalize the payments and other maintenance expenses,  
17 Empire adjusted to the inflation adjusted five-year average of maintenance expenses  
18 for SLCC. This adjustment is a reduction in maintenance expenses of \$678,987.

19 **IV. Riverton Maintenance Normalization**

20 **Q. PLEASE EXPLAIN THE ADJUSTMENT MADE FOR RIVERTON**  
21 **MAINTENANCE NORMALIZATION.**

22 A. Riverton Units 7 and 8 are on five-year major outage schedules. Riverton Unit 7's  
23 last major outage took place in 2005 and Unit 8's last major outage took place in

2003. In order to normalize and account for these maintenance costs, Empire adjusted to the 5-year average maintenance expense level (adjusted for inflation) for the Riverton Plant. This equals an adjustment of \$448,383 to increase maintenance expense.

**V. Miscellaneous Maintenance Normalization**

**Q. PLEASE EXPLAIN THE ADJUSTMENT MADE FOR MISCELLANEOUS MAINTENANCE NORMALIZATION.**

A. In addition to the normalization of the major items listed in the above adjustments, Empire asserts maintenance expenses at its other generating plants, Iatan, Ozark Beach, Energy Center, and State Line Unit 1, should also be normalized to a five year average level adjusted for inflation. Aggregating the adjustments for these plants creates an adjustment of \$553,889. Please refer to Schedule BAM-1 for a breakdown of this adjustment between the plants.

**VI. Amortization of Energy Center and State Line OPSA Catch-Up Payment**

**Q. PLEASE EXPLAIN THE ADJUSTMENT MADE TO ENERGY CENTER AND STATE LINE O&M EXPENSES WITH REGARD TO THE OPERATING PLANT SERVICE AGREEMENT (“OPSA”) CONTRACT.**

A. As part of the OPSA entered between Empire and Siemens-Westinghouse for long-term maintenance on Energy Center Units 1 and 2 and State Line Unit 1, the contract was priced in two components. The first component has been calculated such that it pays for scheduled outages due to operation of the units prior to the signing of the agreement. This first component is thus known as the “catch-up” payment. The second component was priced to pay for and levelize future

1 scheduled outages. "Catch-up" maintenance was performed in late 2001 and into  
2 year 2002. Payment for these "catch-up" inspections began in January 2002 and  
3 continued for the first six months of 2002. Empire and the Commission Staff  
4 agreed in one of Empire's previous rate cases (Case No. ER-2002-424) that these  
5 "catch-up" payments would be amortized over the term of the contract – seven  
6 years. This normalization is detailed in Adjustment No. S-34.4 made by  
7 Commission Staff analyst Phil Williams and attached to my testimony as Schedule  
8 BAM-3. As a result of this normalization O&M is increased \*\* \_\_\_\_\_ \*\*.

9 **VII. Riverton Unit 12 Maintenance**

10 **Q. PLEASE EXPLAIN THE ADJUSTMENT MADE FOR RIVERTON UNIT 12**  
11 **MAINTENANCE.**

12 A. As stated previously, Riverton Unit 12 went into commercial operation on April 10,  
13 2007. Consequently, essentially no O&M expenses for this unit are included in the  
14 test year. Empire made an adjustment of \$100,000 to allow for a level of O&M  
15 expenses to be included for this unit.

16 **Q. HOW WAS THE \$100,000 PER YEAR AMOUNT DETERMINED?**

17 A. First, as part of the preventative maintenance program Unit 12 will require a minor  
18 combustor inspection each year. Siemens, the original equipment manufacturer has  
19 provided a quotation for this inspection of \$\*\* \_\_\_\_\_ \*\*. The remaining  
20 \$\*\* \_\_\_\_\_ \*\* is an attempt to account for consumables used by the unit (i.e. filters,  
21 lubricants, glycol, etc.).

22 **VIII. Asbury SCR O&M**

23 **Q. PLEASE EXPLAIN THE ADJUSTMENT MADE FOR ASBURY SCR O&M.**



1 A. As stated previously, the Asbury SCR is expected to be completed and operational  
2 after Asbury's fall outage. Consequently, no O&M expenses for the SCR are  
3 included in the test year; however, going forward there will obviously be significant  
4 operating and maintenance expenses related to the Asbury SCR. Empire has made  
5 an adjustment of \$1,292,500 to include Asbury SCR O&M expenses in this rate  
6 case.

7 **Q. HOW WAS THE \$1,292,500 PER YEAR AMOUNT DETERMINED?**

8 A. The majority of the SCR O&M is related to the purchase and consumption of  
9 ammonia in the reaction process. Alstom, the original equipment manufacturer for  
10 the SCR project, estimates that at full load the SCR will require 650 lb/hour to  
11 achieve 90% reduction with a starting emission rate of 0.86 lb NOx/mmBtu. From  
12 2002 through 2006, the average capacity factor of Asbury Unit 1 is 78.86%. Using  
13 these values along with a cost of \$490/ton for ammonia, the following calculation  
14 estimates the cost of the ammonia used by the SCR (also see Schedule BAM-2):

15 
$$\$650 \text{ lb/hr} \times 8760 \text{ hrs/yr} \times 78.86\% \times 1 \text{ ton}/2000 \text{ hrs} \times \$490/\text{ton} = \$1,100,120/\text{yr}$$

16 In addition to this cost, Table 2 below summarizes the additional O&M costs  
17 Empire has utilized to arrive at \$1,292,500 / year for SCR O&M.

18 **Table 2**

Item	Description	Cost
<b>Ammonia Supply</b>	90% reduction from 0.86 lb/mmBtu	\$1,100,000
<b>CEMS</b>	Continuous Emissions Monitoring	
- Calibration Gases		\$ 20,000
- Quarterly Maintenance		\$ 50,000
- Repairs / Parts		\$ 5,000
<b>Risk Management Program*</b>	Anhydrous ammonia safety program	
- HAZWOPER* Training	Annual refresher plus new employees	\$ 8,000
- Replacement Suits	Consumed during year	\$ 2,000
- Program Review/Update	Monitoring / updating program required	\$ 2,000
<b>LEPC Meetings</b>	Local Emergency Planning Commission	\$ 500

<b>Mechanical Integrity Eval</b>	Testing of critical piping and tanks	\$ 10,000
<b>Annual Coupon Tests</b>	Evaluation of catalyst integrity	<u>\$ 25,000</u>
<b>TOTAL</b>		<b>\$ 1,292,500</b>

*\* Hazardous Waste Operations and Emergency Response Standard program*

1 **Q. PLEASE EXPLAIN THE ADJUSTMENT MADE FOR ASBURY AND**  
2 **RIVERTON MERCURY ANALYZER MAINTENANCE AND TESTING.**

3 A. On March 15, 2005, EPA issued the Clean Air Mercury Rule (CAMR) to  
4 permanently cap and reduce mercury emissions from coal-fired power plants. The  
5 CAMR requires affected electric utility units to continuously monitor mercury mass  
6 emissions. The Asbury and Riverton plants are in the process of installing  
7 technically-feasible, compliance-capable technologies to insure that the Hg  
8 emission reduction goals of CAMR are met. These mercury analyzers will be in  
9 place in 2008 to allow for testing and certification. Official CAMR mercury  
10 monitoring and reporting begins January 1, 2009. Empire estimates annual O&M  
11 and testing expenses related to these analyzers to be \$284,000.

12 **Q. HOW WAS THE \$284,000 PER YEAR AMOUNT DETERMINED?**

13 A. Table 3 below summarizes these costs on a per plant basis. Since these costs will  
14 apply to both the Riverton and Asbury plants, the \$142,000 amount must be  
15 doubled.

16 **Table 3**

<b>Item</b>	<b>Description</b>	<b>Cost</b>
<b>Ontario-Hydro Testing</b>	Required annual certification	\$ 50,000
<b>Mercury Generator Certification</b>	Mist traceability protocol requirement - \$7,000 per analyzer (2) per quarter	\$ 56,000
<b>Argon Gas</b>	Consumed by analyzer	\$ 1,000
<b>Preventive Maintenance</b>	Annual parts and labor	\$ 35,000
<b>TOTAL (per plant)</b>		<b>\$ 142,000</b>

1   **Q.   WHAT ARE THE VALUES IN TABLE 3 BASED UPON?**

2   A.   The above values are based on estimates obtained from consultants and vendors  
3       within the emissions monitoring industry. Consensus among these consultants and  
4       vendors is that there will be upward pressure on these values due to the large  
5       number of utilities that will be adding similar monitoring equipment at their coal-  
6       fired power plants in order to comply with the EPA CAMR requirements.

7   **FUEL ADJUSTMENT CLAUSE (“FAC”) SUPPORTING INFORMATION**

8   **Q.   WHAT IS THE PURPOSE OF THIS SECTION OF YOUR TESTIMONY?**

9   A.   When requesting a FAC, the Commission requires a utility to provide certain  
10       supporting information per 4 CSR 240-3.161 (2). Specifically, I will respond to  
11       items 16 and 18 of this requested information.

12   **Q.   CONCERNING ITEM 16 WHICH REQUESTS A PROPOSED SCHEDULE**  
13       **AND TESTING PLAN FOR HEAT RATE OR EFFICIENCY TESTS, HOW**  
14       **DO YOU RESPOND?**

15   A.   At the present time, Empire monitors performance of its generating units on an  
16       ongoing basis and logs historical data to determine heat rate and efficiencies of its  
17       generating units.

18   **Q.   WHY DOES EMPIRE MONITOR ITS GENERATING PERFORMANCE**  
19       **ON AN ONGOING BASIS, RATHER THAN USING A SPECIFIC TESTING**  
20       **PROGRAM OR SCHEDULE?**

21   A.   There are at least two significant reasons why Empire has not used a specific testing  
22       schedule on its generating units. First, there are numerous operating conditions  
23       (cold, mild, and hot weather; minimum, partial, or full load; low and high humidity;

1       etc.) for each of Empire's generating units. It is nearly impossible to perform an  
2       efficiency test on a unit one day and compare it to a test of the same unit performed  
3       on another day under different operating conditions and come away with any  
4       relevant correlation. Tracking historical data under numerous operating conditions  
5       seems more relevant to Empire. Secondly, and probably the most significant reason  
6       Empire has not embarked on a specific testing schedule of each unit, is the cost to  
7       perform such a testing regimen. To perform accurate tests the generating units have  
8       to be ramped up and down and operate at numerous load levels during the tests or  
9       even under varying weather conditions. It is obviously not the most economical to  
10      operate units at various load levels or possibly start a unit purely for the purpose of  
11      testing. Empire believes it is more prudent and economical to use historical data  
12      that comes from various load levels and weather conditions that occur during  
13      normal operations rather than operate the unit(s) at inefficient (and more costly)  
14      levels solely for the sake of testing. Further, Empire does not currently possess the  
15      measuring equipment needed to perform extensive performance testing such as that  
16      proposed by The American Society of Mechanical Engineers' Performance Test  
17      Codes ("ASME-PTCs").

18   **Q. ARE YOU SUGGESTING THAT EMPIRE NOT BE REQUIRED TO**  
19   **PERFORM HEAT RATE AND EFFICIENCY TESTS?**

20   A. No. I am suggesting that the heat rate curves available for Empire's units based on  
21      historical data be used to meet this testing requirement rather than direct Empire to  
22      perform specific heat rate tests for each of its units that will provide little to no  
23      benefit when compared to the historical data. In essence this is a continuous

1 “testing” program. If Empire is directed to perform specific unit testing and  
2 scheduling, this will ultimately lead to an increase in fuel and equipment costs  
3 which, in turn, will have to be passed on to its customers.

4 **Q. CONCERNING ITEM 18, IS EMPIRE INCLUDING ANY OF THE COSTS**  
5 **OR MARGINS RELATED TO EMISSION ALLOWANCES IN THE**  
6 **PROPOSED FUEL ADJUSTMENT?**

7 A. Empire is including the cost related to emissions allowances in its fuel adjustment  
8 request at this time. Currently Empire projects that we will have sufficient SO<sub>2</sub>  
9 allowances granted to us by the EPA or in our existing inventory to supply our  
10 needs through about 2012 so the inclusion of FERC account 509 in the FAC is not  
11 expected to have any impact until that time.

12 **Q. DOES THIS CONCLUDE YOUR DIRECT TESTIMONY?**

13 A. Yes, it does.

**THE EMPIRE DISTRICT ELECTRIC COMPANY**  
**Historical TME June Operations and Maintenance Expenses Adjusted for Inflation**

		June Producer Price Index (PPI)						
		143.1	148.7	154	161.7	167.1		
		1.17	1.12	1.09	1.03	1.00		
<u><b>Ozark Beach</b></u>		<u><b>2003</b></u>	<u><b>2004</b></u>	<u><b>2005</b></u>	<u><b>2006</b></u>	<u><b>2007</b></u>	<u><b>5-YR AVG</b></u>	<u><b>Adjustment</b></u>
Operations	\$	241,835.64	\$ 304,782.47	\$ 197,445.83	\$ 200,810.35	\$ 164,719.94	\$ 221,918.85	\$ 57,198.91
Maintenance	\$	24,169.70	\$ 22,063.71	\$ 37,049.89	\$ 9,792.44	\$ 9,670.00	\$ 20,549.15	\$ 10,879.15
<u><b>Asbury</b></u>								
Operations	\$	837,233.99	\$ 909,327.35	\$ 842,193.39	\$ 762,126.94	\$ 796,984.46	\$ 829,573.22	\$ 32,588.76
Maintenance	\$	2,492,687.58	\$ 2,218,013.85	\$ 1,902,680.93	\$ 1,912,768.23	\$ 1,031,566.05	\$ 1,911,543.33	\$ 879,977.28
5-yr Amortization	\$	638,298.30	\$ 598,994.24	\$ 609,380.24	\$ 616,799.01	\$ 256,999.62		
Adjusted Maintenance <sup>3</sup>	\$	1,854,389.28	\$ 1,619,019.61	\$ 1,293,300.69	\$ 1,295,969.22	\$ 774,566.43	\$ 1,367,449.05	\$ 592,882.62
<u><b>Riverton</b></u>								
Operations	\$	386,211.40	\$ 399,913.02	\$ 354,402.28	\$ 293,438.62	\$ 312,563.76	\$ 349,305.82	\$ 36,742.06
Maintenance	\$	2,093,897.30	\$ 687,568.83	\$ 663,593.86	\$ 1,019,745.65	\$ 555,722.31	\$ 1,004,105.59	\$ 448,383.28
<u><b>State Line</b></u>								
Operations	\$	37,751.32	\$ 42,570.01	\$ 28,794.61	\$ 23,105.05	\$ 46,995.21	\$ 35,843.24	\$ (11,151.97)
Maintenance	\$	1,032,871.39	\$ 641,885.02	\$ 191,130.02	\$ 69,067.28	\$ 456,026.35	\$ 478,196.01	\$ 22,169.66
	\$	-						
<u><b>Energy Center</b></u>								
Operations	\$	175,964.12	\$ 286,786.16	\$ 234,074.61	\$ 299,130.08	\$ 267,988.56	\$ 252,788.71	\$ (15,199.85)
Maintenance	\$	1,311,827.20	\$ 2,656,160.26	\$ 691,464.91	\$ 234,204.58	\$ 276,666.51	\$ 1,034,064.69	\$ 757,398.18
<u><b>Iatan</b></u>								
Operations	\$	285,079.99	\$ 218,275.04	\$ 227,256.65	\$ 214,316.93	\$ 244,814.80	\$ 237,948.68	\$ (6,866.12)
	\$	988,742.95	\$ 739,356.28	\$ 1,093,255.31	\$ 504,661.59	\$ 1,127,200.92	\$ 890,643.41	\$ (236,557.51)
<u><b>SLCC</b></u>								
Operations	\$	1,404,364.56	\$ 1,201,800.64	\$ 1,073,341.31	\$ 1,089,583.00	\$ 914,210.96	\$ 1,136,660.09	\$ 222,449.14
Maintenance	\$	3,010,040.67	\$ 2,526,937.50	\$ 2,799,411.69	\$ 3,258,829.34	\$ 3,747,538.03	\$ 3,068,551.45	\$ (678,986.58)
<u><b>Total</b></u>								
Operation	\$	3,368,441.02	\$ 3,363,454.70	\$ 2,957,508.68	\$ 2,882,510.97	\$ 2,748,277.69	\$ 3,064,038.61	\$ 315,760.92
Maintenance	\$	10,315,938.48	\$ 8,892,991.20	\$ 6,769,206.37	\$ 6,392,270.10	\$ 6,947,390.55	\$ 7,863,559.34	\$ 916,168.79

**Notes**

1. All values are TME June of the respective year
2. Values for 2003 through 2006 are adjusted for inflation using the Producer Price Index (PPI) listed above.
3. "Asbury Adjusted Maintenance" equals "Maintenance" less "5-year Amortization".

# THE EMPIRE DISTRICT ELECTRIC COMPANY

## Asbury Maintenance Adjustment Calculations

SCHEDULE BAM-2

### Estimated 5-year Amortization Expense

Desription	Amount	Account
Turbine Outage / Inspection	\$ 2,000,000	513168
Boiler Chemical Clean	\$ 225,000	512165
	<u>\$ 2,225,000</u>	
Amortized over 5-years	\$ 445,000	
Amortization Expense in Test Year	<u>\$ 257,000</u>	
Amortization Adjustment	\$ 188,000	

### Calculation of Asbury SCR Ammonia Expense

Estimated Ammonia Consumption Rate <sup>1</sup>	650 lbs/hour
Annual Hours per Year x	8,760 hours/year
5-year Average Capacity Factor x	78.9%
Annual Ammonia Consumption in lbs	<u>4,490,288 lbs-ammonia/year</u>
	÷ 2,000 tons/lb
Annual Ammonia Consumption in tons	<u>2,245 tons-ammonia/year</u>
	x \$ 490 \$/ton-ammonia
Annual Ammonia Expense	<u>\$ 1,100,000 \$/year</u>

Note: 1. Based on 90% Reduction from 0.86 lb Nox/mmbtu - estimate provided by OEM

Empire District Electric Company  
Case No. ER-2002-424  
12-Months Ended Dec. 31, 2001

File Name: Maintenance Contract for SL1 - EC1 - EC2

Prepared By: PKW

Date Prepared: Aug 2, 2002

Date Printed: 8/13/2002

Time Printed: 12:43 PM

Sheet Name: Maint. To Meet Spec.

Maintenance to meet specifications for the Turbine Contract Maintenance

	Acct. No.	Total Expense
<u>State Line 1, Energy Center 1 &amp; 2 Maintenance to meet contract requirements:</u>		
Energy Center 1	553.231	\$ ** **
Energy Center 2	553.231	\$ ** **
State Line 1	553.231	\$ ** **
Total Cost to meet specifications		\$ ** **
Divided by:		\$ 7
Staff will normalize over 7 years the life of maintenance contracts.		\$ ** **
Amount included in Test Year expense		\$ -
Adjustment to Increase Test Year Expense		\$ ** **
Adjustment No.		S-34.4

Source:

Company Response to Staff D.R. No.'s 242 and 243.

These items were not booked during the test year but were booked during the first 6 months of 2002

Additional Painting costs which have began but are not complete have not been included in Staffs adjustments.

**NP**



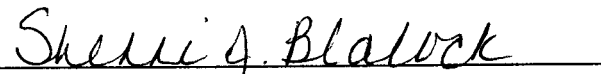
**AFFIDAVIT OF BLAKE A. MERTENS**

STATE OF MISSOURI )  
 ) ss  
COUNTY OF JASPER )

On the 1<sup>st</sup> day of October, 2007, before me appeared Blake A. Mertens, to me personally known, who, being by me first duly sworn, states that he is the Manager of Strategic Projects of The Empire District Electric Company and acknowledges that he has read the above and foregoing document and believes that the statements therein are true and correct to the best of his information, knowledge and belief.

  
Blake A. Mertens

Subscribed and sworn to before me this 1<sup>st</sup> day of October, 2007.

  
Notary Public

My commission expires: Nov. 16, 2010.

