

Exhibit No.
Issue: Operating and Maintenance Expense
Witness: Blake A. Mertens
Type of Exhibit: Direct Testimony
Sponsoring Party: Empire District
Case No.
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Before the Public Service Commission
of the State of Missouri

Direct Testimony

Of

Blake A. Mertens

April 2004

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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 Street, 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 Planning
6 Engineer – Energy Supply.

7 Q. PLEASE DESCRIBE YOUR EDUCATIONAL BACKGROUND FOR THE
8 COMMISSION.

9 A. I graduated from Kansas State University in 2000 with a Bachelor of Science
10 Degree in Chemical Engineering with a minor in Business.

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

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

1 of the California energy crisis of 2000 – 2001. I went to work for Empire in
2 November of 2001 as a Staff Engineer in Energy Supply where my duties included
3 tracking of plant capital and operating & maintenance (“O&M”) expenses,
4 involvement in Energy Supply regulatory issues, evaluation of new generating
5 resource options, assisting in the construction of new plant, and assisting in the
6 modeling and tracking of fuel and purchased power costs. In 2003, my title was
7 changed to Planning Engineer with much the same duties and more responsibilities
8 in the area of generation planning.

9 Q. WHAT IS THE PURPOSE OF YOUR DIRECT TESTIMONY IN THIS CASE
10 BEFORE THE MISSOURI PUBLIC SERVICE COMMISSION
11 (“COMMISSION”)?

12 A. In this testimony, I will cover test year O&M expenses for the Energy Supply
13 division and necessary adjustments needed to more accurately account for normal
14 levels of O&M expenses.

15 Q. WHAT AREAS OR PLANTS COMPRISE TOTAL ENERGY SUPPLY O&M
16 EXPENSES?

17 A. Total Energy Supply O&M expenses include operating and maintenance expenses
18 incurred at Empire’s Asbury, Energy Center, Ozark Beach, Riverton, and State Line
19 plants. In addition, Empire’s 12-percent share of O&M expenses incurred at the
20 Kansas City Power & Light operated Iatan plant are included in total O&M
21 expenses. Operating expenses related to the duties of the Wholesale Energy Group
22 and Energy Service support staff are also included in total Energy Supply O&M
23 expenses.

1 Q. WHAT WAS THE TEST YEAR'S (TWELVE-MONTHS-ENDING DECEMBER
2 31, 2003) LEVEL OF O&M EXPENSES FOR ENERGY SUPPLY, EXCLUDING
3 LABOR?

4 A. O&M expenses for 2003 totaled \$13,421,628, which includes 100 percent of State
5 Line Combined Cycle's ("SLCC's") O&M expenses. This unit is jointly owned –
6 Westar owns 40% and Empire owns 60%. Thus, Empire is responsible for
7 approximately 60 percent of these costs, making Empire's total Energy Supply
8 O&M expenses equal \$11,664,120 for the test year.

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

12 A. Yes. Six specific adjustments were made to adjust the test year's level of expense
13 to better represent ongoing levels. These adjustments are:

14 I. The amortization of Energy Center and State Line's OPSA Catch-Up payments;

15 II. The amortization of expenses related to moving Asbury's transformer;

16 III. Normalization of Riverton's level of expenses due to turbine outage;

17 IV. Inclusion of the costs of a generator inspection;

18 V. Reversal of a double accrual of State Line Combined Cycle's credit associated
19 with its LTP; and

20 VI. An increase in Energy Center's O&M expenses to account for the new Energy
21 Center Units 3 and 4.

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

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

4 A. As part of the OPSA entered between Empire and Sieimens-Westinghouse for long-
5 term maintenance on Energy Center Units 1 and 2 and State Line Unit 1, the
6 contract was priced in two components. The first component has been calculated
7 such that it pays for scheduled outages due to operation of the units prior to the
8 signing of the agreement. This first component is thus known as the “catch-up”
9 payment. The second component was priced to pay for and levelize future
10 scheduled outages. “Catch-up” maintenance was performed in late 2001 and into
11 year 2002. Payment for these “catch-up” inspections began in January 2002 and
12 continued for the first six months of 2002. It was agreed with Commission Staff in
13 Empire’s last rate case (Case No. ER-02-424) that these “catch-up” payments
14 would be amortized over the term of the contract – seven years. This normalization
15 is detailed in Adjustment No. S-34.4 made by Commission Staff analyst Phil
16 Williams and attached as Schedule BAM-1. The result of the inclusion of this
17 normalization is an increase of **\$_____** in O&M expenses.

18 **II. Amortization of Expenses Related to Moving Asbury’s Transformer**

19 Q. PLEASE EXPLAIN THE ADJUSTMENT MADE TO ASBURY O&M
20 EXPENSES IN RELATION TO THE MOVING OF ASBURY’S
21 TRANSFORMER.

22 A. During the last major outage at Asbury (2001) an inspection of the main step-up
23 transformer revealed that the transformer was in poor shape and needed to be

1 replaced. The lead time for a replacement transformer was five to six months. The
2 existing transformer could be used temporarily, until a replacement transformer
3 arrived, but because of safety concerns, the transformer would have to be moved
4 away from high traffic areas and the main plant building. The cost of moving this
5 transformer was expensed in total during December 2001 at \$677,102.11 and not
6 included in Asbury's 5-year major maintenance outage amortization. It was agreed
7 with Commission Staff in Empire's last rate case (Case No. ER-02-424) that these
8 expenses would be normalized over a five-year period. This normalization is
9 detailed in Adjustment No. S-47.3 made by Staff analyst Phil Williams and attached
10 as Schedule BAM-2. The result of the inclusion of this normalization is an increase
11 of \$135,420 in O&M expenses.

12 **III. Normalization of Riverton's O&M expenses**

13 Q. WAS THE LEVEL OF O&M EXPENSE EXPERIENCED AT THE RIVERTON
14 PLANT NORMAL DURING THE TEST YEAR?

15 A. No. During 2003, Riverton Unit 8 underwent its 5-year major turbine outage.
16 O&M expenses were higher during the test year than normal because of this.

17 Q. WHAT ADJUSTMENT WAS MADE TO ACCOUNT FOR THIS HIGHER
18 THAN NORMAL LEVEL OF EXPENSES?

19 A. O&M expenses at Riverton were averaged over a 5-year period. Since Riverton
20 Unit 7 and Riverton Unit 8 are currently on 5-year major outage schedules, this
21 allows for a normalization of these outage costs. The five year average of Riverton
22 O&M expenses is \$1,086,819, as seen in Schedule BAM-3. Test year expenses

1 were \$2,046,667, meaning an adjustment of <\$959,848> was made to get to the
2 five-year normalization level.

3 Q. DO YOU SEE ANY RISK INHERENT IN THIS NORMALIZED LEVEL OF
4 EXPENSES FOR RIVERTON?

5 A. Yes. While these units have operated at extremely reliable levels in recent history,
6 the fact of the matter is that these units are both over 50 years in age. As units
7 become older, the amount of maintenance required to ensure reliable and safe
8 operation naturally increases. This was proven during Unit 8's turbine outage last
9 spring when a crack was found in the casing of the high pressure section of the
10 turbine that had to be repaired.

11 **IV. Generator Inspection**

12 Q. PLEASE EXPLAIN THE ADJUSTMENT MADE FOR THE INCLUSION OF A
13 GENERATOR INSPECTION IN NORMAL O&M EXPENSES.

14 A. During 2003, no generator inspections were performed on any of Empire's units.
15 The cost of a thorough generator inspection is estimated at \$500,000, the amount of
16 the adjustment made to test year expenses.

17 Q. WHY SHOULD THE COSTS OF A GENERATOR INSPECTION BE
18 CONSIDERED NORMAL?

19 A. Empire currently has 20 generators in its system. Asbury is the only unit that has
20 the cost of its five-year generator inspection amortized and included in annual
21 expenses along with the rest of the expenses associated with its five-year
22 maintenance outage. Original equipment manufacturers ("OEM's") generally
23 recommend that generator inspections take place every five years. Obviously,

1 Empire has a few units that do not operate enough hours in a year to warrant five
2 year inspections. However, Riverton Units 7 and 8, SLCC, State Line 1, and all
3 four of the Energy Center units should be considered as regular operators that
4 would nominally be subject to five year inspections. These total 10 generators that
5 are subject to 5-year inspections intervals. With this number of regularly operating
6 generators in mind, Empire should be performing two inspections per year to adhere
7 to OEM recommendations.

8 Q. IF EMPIRE SHOULD BE PERFORMING THIS MANY INSPECTIONS, WHY
9 WERE NONE PERFORMED IN 2003?

10 A. SLCC has only been in commercial operation for a little over two years and Energy
11 Center Units 3 and 4 are both new units, which would mean none of those units
12 would have five years of operation to require an inspection. State Line 1 had a
13 generator inspection performed in 2002. Energy Center Unit 2 just completed a
14 generator inspection and repairs, and Energy Center Unit 1 is due for an inspection.
15 Riverton Unit 7 had a generator inspection performed in year 2000 and will be due
16 for an inspection in 2005. Riverton Unit 8 had an inspection in 1998, meaning it is
17 currently due for a generator inspection. One was not performed in 2003 because of
18 other significant maintenance taking place during its 5-year major outage.

19 **V. Double Accrual of SLCC Maintenance Contract Credit**

20 Q. PLEASE DESCRIBE THE LONG-TERM MAINTENANCE CONTRACT THAT
21 WAS ENTERED BETWEEN EMPIRE AND SIEMENS-WESTINGHOUSE.

22 A. In June 2001, Empire entered into a long term maintenance agreement ("LTP") for
23 scheduled outage services for the two combustion turbines that are a part of SLCC

1 (SLCC 2-1 and 2-2). Scheduled outage services include Major Combustor
2 inspections (every 400 Equivalent Starts ("ES") or 8,000 Equivalent Base Hours
3 ("EBH")), Turbine Hot Path inspections (every 800 ES or 24,000 EBH), and Major
4 inspections (every 1,600 ES or 48,000 EBH). The term of the contract is to
5 coincide with two major maintenance cycles determined on a starts-based
6 inspection cycle. The interval between these inspections is dependent upon
7 operating characteristics, most importantly the number of Equivalent Starts and
8 Equivalent Base Hours the units experience. The main purposes of the LTP
9 contract are to ensure continued reliable operation and to levelize the payments for
10 the maintenance inspections, instead of having to incur large expenses every time
11 one of these inspections is required.

12 Q. WHAT ARE THE PAYMENT TERMS OF THIS CONTRACT?

13 A. First, there is a fixed part of the payment that Empire makes to Siemens-
14 Westinghouse of **\$_____** annually that is paid in quarterly installments.
15 Second, Empire pays an annual variable fee of **_____** that is also paid in
16 quarterly installments. The annual variable fee is based on the assumption that each
17 unit will experience **____** Equivalent Starts and **____** Equivalent Base
18 Load Hours per contract year. To the extent that actual operating characteristics
19 differ from those assumed in the contract, a true-up of the variable payments will
20 take place at the end of each contract year (each June). Both of these payments are
21 subject to escalation. In addition, Westar is responsible for approximately 40% of
22 the contract costs due to their 40% ownership in SLCC.

23 Q. PLEASE DESCRIBE THE TRUE-UP PROCESS.

1 A. If during the year SLCC's units have fewer than ** ____ ** ES and/or ** ____ ** EBH
2 each, then Siemens-Westinghouse credits Empire/Westar for the previous year
3 because the interval between outages will have increased. Conversely, if SLCC's
4 units operate more than the number of ES and/or EBH, then Empire/Westar will
5 owe Siemens-Westinghouse an additional sum of money because the interval
6 between outage inspections will have decreased.

7 Q. WHAT WAS THE RESULT OF THE TRUE-UP PROCESS AT THE END OF
8 THE LAST CONTRACT YEAR (JUNE 2003)?

9 A. In June of 2003 a credit of **\$ _____ ** was due to Empire/Westar from
10 Siemens-Westinghouse.

11 Q. WHY WAS THE AMOUNT OF THE CREDIT SO LARGE?

12 A. As I stated previously, the true-up is based on actual operating characteristics
13 during the contract year. From July 2002 to June 2003, the units averaged 107 ES
14 apiece and 2,736 EBH apiece. This is in comparison to the 250 ES and 4000 EBH
15 assumed per unit when deriving contract payment terms. SLCC operated
16 significantly below these parameters (as evidenced by the numbers above) because
17 the unit experienced very few trips and was not required to operate as many hours
18 because of a favorable spot purchased power market and a short-term energy
19 contract that was entered with American Electric Power.

20 Q. DOES THE TRUE-UP PROCESS HAVE ANY IMPLICATIONS TO EMPIRE?

21 A. Yes. As stated previously, one of the goals of the LTP is to levelize the scheduled
22 outage maintenance costs. The debit or credit that the true-up process creates each
23 June at least partially skews the levelization goal. In addition, since the contract

1 year runs from July to June of each year, a single debit or credit occurring in June
2 of each year does not properly account for the part of the debit or credit that should
3 have been allocated to the previous year. Proper accounting requires expenses to be
4 allocated to the period in which they occurred.

5 Q. WHAT HAS EMPIRE DONE TO HELP ALLEVIATE THE ISSUES THIS
6 ANNUAL TRUE-UP HAS CREATED?

7 A. Realizing that this was going to be a continuing situation because it is extremely
8 unlikely that the contract assumptions for operating characteristics would ever be
9 exactly equal to actual operations, Empire implemented a credit/debit accrual
10 process starting for the contract year of July 2003 to June 2004. The basis of this
11 accrual process was to forecast annual operating characteristics for each unit, i.e.
12 the number of ES and EBH each unit would experience throughout the contract
13 year. Based on these operating characteristics the amount of LTP contract costs
14 would be calculated for the contract year and evenly spread throughout the year.
15 Each month the spreadsheet is updated with actual operating characteristics
16 replacing the estimated operating characteristics for that month. The amount of the
17 estimated annual debit/credit is updated each month and spread evenly over the
18 remaining months of the year. The goal of this accrual process is for the amount of
19 the actual debit/credit that will take place in June of each year to be expensed in the
20 proper period instead of a single debit/credit in June. This allows Empire to keep
21 the scheduled outage maintenance costs relatively levelized and also properly
22 account for costs in the accounting period in which they occurred. A printed copy of

1 the spreadsheet used to accrue the debit/credit for the last six months of 2003 is
2 attached as Schedule BAM-4.

3 Q. DID THE IMPLEMENTATION OF THIS PROCESS IN THE SECOND HALF
4 OF 2003 CREATE ANY OTHER ISSUES?

5 A. Yes. Empire recognized a large credit due from Seimens-Westinghouse in June of
6 2003 in the amount off **\$_____**. This credit was for a 12 month period
7 encompassing July 2002 through June 2003. In July 2003 Empire also began
8 accruing on a monthly basis for the estimated credit that will take place in June
9 2004. Empire in essence recognized six months of the 2002 credit in year 2003.
10 Therefore, Empire's books reflect 18 months of the credit related to the LTP
11 contract in year 2003. For this reason, the LTP contract costs totaled only
12 **\$_____** for the twelve months ending December 31, 2003.

13 Q. WHAT DOES EMPIRE ESTIMATE AS THE PROPER AMOUNT OF ANNUAL
14 LTP COSTS?

15 A. Empire estimates this amount to be \$3,665,565. This is based on the unit remaining
16 on an hours-based maintenance cycle and operating at 4200 EBH per unit. This
17 4200 EBH per unit is based on the number of hours the units ran in Model Run 1
18 presented in the testimony of Empire expert witness Jill Tietjen. This means an
19 adjustment to SLCC O&M expenses of \$1,599,581 is necessary, of which Empire's
20 share, and thus the amount adjusted in Empire's rate filing, is \$959,748.

21 Q. DOES THIS AMOUNT OF LTP CONTRACT EXPENSE PRESENT ANY RISK
22 TO EMPIRE?

1 A. Yes. As stated previously, annual variable payments are based on actual ES and
2 EBH experienced by the units in the contract year. It is important to note that an ES
3 is not simply equal to a start of the unit; rather, an equivalent start is derived by an
4 involved calculation that takes into account such criteria as unit trips, at what level
5 of operation the unit tripped, and attempted starts that were not successful, as well
6 as several others. An especially important criterion is that each full load trip of a
7 combustion turbine is equal to 20 ES. Bearing this in mind and that the actual
8 variable payments Empire makes to Siemens-Westinghouse equal **\$_____**
9 before the true-up process, the potential for LTP contract expenses to be higher than
10 the adjusted level is definitely of concern. This is evidenced by contract year July
11 2001 to June 2002. In that year operations were close enough to those projected in
12 the contract that no credit or debit was issued in the true-up process and the entire
13 **\$_____** was paid to Siemens-Westinghouse for that contract year.

14 **VI. Energy Center Units 3 and 4 Maintenance**

15 Q. WHY WAS AN ADJUSTMENT MADE TO THE O&M COSTS FOR ENERGY
16 CENTER UNITS 3 and 4?

17 A. The Energy Center Units 3 and 4 were put into commercial operation on April 24th
18 and 25th 2003, meaning that the costs for a full year of maintenance related to these
19 items are not included in the test year. These units must regularly undergo annual
20 inspections, the cost of which inspections are not reflected in twelve-month-ending
21 December 2003 O&M expenses. Additionally, long-term maintenance of these
22 units includes a hot-path inspection once the units reach 25,000 hours of operation.

1 Q. WHAT ADJUSTMENT DID YOU MAKE TO ACCOUNT FOR THE
2 ADDITIONAL MAINTENANCE NEEDED ON ENERGY CENTER UNITS 3
3 AND 4?

4 A. Pratt & Whitney, the original equipment manufacturer of Energy Center Units 3 and
5 4, has estimated the cost of these annual inspections and the consumables related to
6 these inspections. The average annual cost of these inspections is **\$_____** per
7 unit. Additionally, Pratt & Whitney estimates the cost of the 25,000 hour hot-path
8 inspection at **\$_____** per unit. Empire could enter into a long-term
9 maintenance agreement much like it has for its large frame units (Energy Center 1
10 and 2, State Line 1, and SLCC) to levelize this cost; however, the magnitude of the
11 cost of this maintenance is much smaller than that for large frame units and Empire
12 therefore does not see any benefit at this time in a long-term maintenance
13 agreement for these units. Empire believes it to be fair and equitable to levelize this
14 cost over the estimated inspection interval. Assuming 1250 hours of operation per
15 unit, the inspection interval would be 20 years. 1250 hours of operation per year is
16 similar to the output of model Run 1 presented in Empire witness Jill Tietjen's
17 testimony (average 1,113 hours each) and also the number of hours the units have
18 ran to date since their commercial operation nearly one year ago (average 1,373
19 hours each). Levelization of the hot-path inspection cost presented above over this
20 term would equate to **\$_____** per year per unit, not including any inflation.
21 The total adjustment for the annual inspections and for the levelization of the hot-
22 path inspection costs for two units equals **\$_____**.

23 **Summary**

1 Q. WHAT IS THE TOTAL AMOUNT OF ADJUSTMENTS MADE TO TEST
2 YEAR LEVELS OF O&M EXPENSES?

3 A. Adjustments totaling \$1,008,204 were made and are summarized in Schedule
4 BAM-5.

5 Q. DOES THIS CONCLUDE YOUR DIRECT TESTIMONY?

6 A. Yes, it does.