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Issue: Operating and Maintenance Expense
Witness: Blake A. Mertens
Type of Exhibit: Direct Testimony
Sponsoring Party: Empire District
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Before the Public Service Commission
of the State of Missouri

Direct Testimony

Of

Blake A. Mertens

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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.

Introduction

Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

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

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

A. The Empire District Electric Company ("Empire" or "Company"), I am Planning Engineer – Energy Supply.

Q. PLEASE DESCRIBE YOUR EDUCATIONAL BACKGROUND FOR THE COMMISSION.

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

Q. PLEASE GIVE AN OVERVIEW OF YOUR PROFESSIONAL EXPERIENCE.

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

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

Q. WHAT IS THE PURPOSE OF YOUR DIRECT TESTIMONY IN THIS CASE BEFORE THE MISSOURI PUBLIC SERVICE COMMISSION ("COMMISSION")?

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

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

A. Total 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 total O&M expenses. Operating expenses related to the duties of the Wholesale Energy Group and Energy Service support staff are also included in total Energy Supply O&M expenses.

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

A. O&M expenses for 2003 totaled $13,421,628, which includes 100 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 these costs, making Empire's total Energy Supply O&M expenses equal $11,664,120 for the test year.

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

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

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

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

IV. Inclusion of the costs of a generator inspection;

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

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

I. 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 Sieimens-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 scheduled outages. "Catch-up" maintenance was performed in late 2001 and into year 2002. Payment for these "catch-up" inspections began in January 2002 and continued for the first six months of 2002. It was agreed with Commission Staff in Empire's last rate case (Case No. ER-02-424) that these "catch-up" payments would be amortized over the term of the contract – seven years. This normalization is detailed in Adjustment No. S-34.4 made by Commission Staff analyst Phil Williams and attached as Schedule BAM-1. The result of the inclusion of this normalization is an increase of **$_____** in O&M expenses.

II. Amortization of Expenses Related to Moving Asbury's Transformer

Q. PLEASE EXPLAIN THE ADJUSTMENT MADE TO ASBURY O&M EXPENSES IN RELATION TO THE MOVING OF ASBURY'S TRANSFORMER.

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

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

III. Normalization of Riverton's O&M expenses

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

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

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

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

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

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

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

IV. Generator Inspection

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

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

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

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

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

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

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

V. Double Accrual of SLCC Maintenance Contract Credit

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

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

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

Q. WHAT ARE THE PAYMENT TERMS OF THIS CONTRACT?

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

Q. PLEASE DESCRIBE THE TRUE-UP PROCESS.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

VI. Energy Center Units 3 and 4 Maintenance

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

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

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

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

Summary

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

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

Q. DOES THIS CONCLUDE YOUR DIRECT TESTIMONY?

A. Yes, it does.