

Exhibit No.

**Issue: Fuel & Purchased Power Expense;
Interim Energy Charge; Energy
Supply O&M Expense**

Witness: Brad P. Beecher

Type of Exhibit: Direct Testimony

Sponsoring Party: Empire District

Case No. ER-2002-424

Date Testimony Prepared: 2/25/02

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

Direct Testimony

Of

Brad P. Beecher

February 2002

FILED²
MAR 08 2002
**Missouri Public
Service Commission**

DIRECT TESTIMONY
OF
BRAD P. BEECHER
THE EMPIRE DISTRICT ELECTRIC COMPANY
BEFORE THE
MISSOURI PUBLIC SERVICE COMMISSION
CASE NO.

1 **I. Introduction**

2 Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

3 A. Brad P. Beecher. 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 Vice President -
6 Energy Supply.

7 Q. PLEASE STATE YOUR EDUCATIONAL BACKGROUND FOR THE COMMISSION.

8 A. I was graduated from the Kansas State University in 1988 with a Bachelor of Science
9 Degree in Chemical Engineering.

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

11 A. I was employed by Empire immediately following graduation from Kansas State University
12 in May of 1988. From May of 1988 through August of 1999 I held roles as a staff engineer
13 at Empire's Riverton Power Plant, in budgeting and fuel procurement in our Energy Supply
14 Department and finally as Director of Strategic Planning. In August of 1999 Black & Veatch
15 employed me. Between August of 1999 and February of 2001, I held roles as Service Area
16 Leader for the Strategic Planning Group of Black & Veatch's Power Sector Advisory
17 Services and as Associate Director of Marketing and Strategic Planning in their Energy

1 E&C group. I rejoined Empire as General Manager - Energy Supply in February 2001. I was
2 elected Vice President - Energy Supply in April 2001. Currently, my responsibilities
3 include all of Empire's energy supply functions including power plant construction,
4 operation & maintenance, energy trading, and fuel procurement.

5 Q. WHAT IS THE PURPOSE OF YOUR DIRECT TESTIMONY IN THIS CASE?

6 A. The purpose of my direct testimony is three-fold. First, in Section II, I will set out a
7 proposed level of expense for on-system fuel and purchased power. Section II also includes
8 an alternative proposal to continue the Interim Energy Charge ("IEC") established in Case
9 No. ER-2001-299; Section III will describe the production cost model that Empire utilized
10 to determine fuel and purchased power expense and special considerations that were taken
11 into account during the modeling process; and Section IV will cover O&M adjustments in
12 Energy Supply.

13 **II. On-System Energy Level of Expense**

14 Q. WHAT LEVEL OF EXPENSE FOR ON-SYSTEM FUEL AND PURCHASED POWER IS
15 EMPIRE RECOMMENDING IN THIS CASE?

16 A. Empire recommends \$105,093,194 total Company for on-system fuel and purchased power
17 expense for the projected energy requirements of 4,844,400 MWh's. This amount can be
18 separated into the following components: \$88,899,674 for fuel and purchased power
19 excluding purchase power demand charges; and \$16,193,520 for purchase capacity demand
20 charges for Net System Input ("NSI"). On a unitized basis expenses are predicted to be
21 \$21.69/MWh. This compares to an actual unitized cost of \$24.16/MWh for the calendar year
22 2001.

23 Q. IS THERE AN ALTERNATIVE MANNER IN WHICH FUEL AND PURCHASED
24 POWER EXPENSES MIGHT BE INCLUDED IN THIS CASE?

25 A. Yes. In Empire's last Missouri rate case (Case No. ER-2001-299), a rider termed the IEC
26 was incorporated in Empire's rates to specifically address the volatility and unpredictability
27 of natural gas prices. In addition to a fixed amount of fuel and purchased power expense that

1 Empire is allowed to recover through its rates, the IEC adds an additional charge which is
2 subject to true up and refund to account for the volatility and unpredictability of natural gas
3 prices. I will explain more of the process later in my direct testimony, but basically it is a
4 good method to remove a portion of the volatility that can negatively affect Empire and its
5 ratepayers.

6 Q. WHAT HAS EMPIRE DONE SINCE THE LAST RATE CASE TO ALLEVIATE SOME
7 OF THE RISK DUE TO VOLATILE NATURAL GAS PRICES?

8 A. Over the past year, Empire has implemented an Energy Risk Management Policy and added
9 staff that specifically focus its efforts on the purchasing and hedging of power and natural
10 gas. The Energy Risk Management Policy sets targets as to how much natural gas Empire
11 must have hedged at any point in time. In general the Risk Management Policy brings more
12 sophistication and discipline to our fuel procurement.

13 Q. YOU MENTION THE TERM "HEDGED." PLEASE EXPLAIN THE TERM "HEDGED."

14 A. Specifically, I mean protected against the risk of upward price movements. Empire's Risk
15 Management Policy allows the utilization of traditional physical purchases and the
16 utilization of financial tools such as call options, collars, swaps, and futures contracts to
17 protect against upward price movements.

18 Q. WHAT ARE THE RISK MANAGEMENT POLICY TARGETS?

19 A. The policy requires that we meet the following hedging targets:

20 Year 1 60-80 percent

21 Year 2 40-60 percent

22 Year 3 20-40 percent

23 Year 4 00-20 percent

24 By way of example, by the end of 2001 our policy required that we have 60-80 percent of
25 2002 gas needs hedged, 40-60 percent of 2003, 20-40 percent of 2004, and 0-20 percent of
26 2005. In simplistic terms, we are simply dollar cost averaging. This strategy will remove
27 volatility for both Empire and our customers.

BRAD P. BEECHER
DIRECT TESTIMONY

1 Schedule BPB-1, attached to this direct testimony, shows Empire's natural gas positions
2 as of February 18, 2002.

3 Q. DOES THE ENERGY RISK MANAGEMENT POLICY ALLEVIATE ALL OF
4 EMPIRE'S RISK IN FUEL AND PURCHASED POWER EXPENSES?

5 A. No. Empire estimates it will burn about 12 million MMBtu of natural gas in the year 2002.
6 If Empire had none of its natural gas hedged, a change in natural gas commodity price of
7 one dollar (\$1/MMBtu) would have an impact on Empire of about \$12 million. However,
8 Empire has approximately 80 percent of its natural gas hedged for the year 2002. Assuming
9 the Commission includes our hedged gas costs in rates, a one-dollar (\$1/MMBtu) change in
10 natural gas price would only have an impact on Empire of about \$2.4 million dollars (20
11 percent of \$12 million).

12 In addition to risks in these markets, Empire's fuel and purchased power expenses are
13 exposed to significant risk due to wholesale power cost volatility. If one of Empire's more
14 efficient and lower operating cost units is unable to operate, one of Empire's less efficient
15 units will have to produce that energy or we will have to purchase non-contract energy
16 directly on the wholesale power market. The cost and availability of non-contract purchase
17 energy have always been points of disagreement among Commission Staff and the
18 Company. The fact is, where long-term contracts are not involved, no one can accurately
19 predict future prices. It is the unpredictability and magnitude of items like non-contract
20 power prices and natural gas prices on a company the size of Empire with its unique
21 generation characteristics that makes the recently-adopted IEC tool one that is balanced and
22 fair for the Company and the customer.

23 Q. DOES EMPIRE BELIEVE THE IEC IS AN EFFECTIVE MEANS OF ADDRESSING
24 THE VOLATILITY IN THE NATURAL GAS AND WHOLESALE ELECTRICITY
25 MARKETS?

26 A. Yes. Implementation of an IEC results in rates that allow Empire to recover at least the level
27 of fuel and purchased power expenses which it has experienced on an historical basis, and at

1 most, costs which were recently prevalent in the market. The IEC only allows Empire to
2 ultimately recover its actual prudently incurred fuel and purchased power costs within a
3 band set during a rate proceeding. The IEC does not ensure that Empire will not be subject
4 to losses due to large swings in the natural gas and wholesale electricity markets, but it does
5 help in minimizing the effects of some of the peaks and valleys that are certain to occur in
6 the market.

7 Q. GAS PRICES HAVE FALLEN DRAMATICALLY SINCE THE LAST CASE. DOESN'T
8 THIS OBVIATE THE NEED FOR THE IEC?

9 A. On the contrary. If natural gas costs had been set at the then current rate during the last case,
10 the customer would have been paying far more than they will under the IEC rider. This fall
11 in natural gas prices further supports that no party can accurately forecast future spot gas
12 prices.

13 Q. DO YOU HAVE A RECOMMENDATION FOR THE LEVEL OF THE IEC?

14 A. Yes. In Case No. ER-2001-299 the rates (equated to generation costs) were \$23.37/MWh
15 base with a \$5/MWh IEC rider. Due to the drop in gas prices and Empire's hedging policy, I
16 would now recommend base rates of \$21.69/MWh with a \$2.47/MWh IEC rider.

17 Q. HOW DID YOU COME UP WITH THE SIZE OF THE IEC RIDER?

18 A. I simply took 2001's actual costs of \$24.16/MWh and subtracted our modeled expected
19 costs of \$21.69/MWh to get an IEC of \$2.47/MWh. The new IEC would be about one-half
20 the size of the current IEC. Further back-up for the IEC calculation is provided in Schedule
21 BPB-2.

22 **III. Production Cost Model**

23 Q. DID EMPIRE USE A PRODUCTION COST MODEL TO DETERMINE THE LEVEL OF
24 EXPENSE FOR ENERGY?

25 A. Yes. Empire utilized the PROSYM production cost model.

26 Q. BRIEFLY DESCRIBE THE PROSYM MODEL.

1 A. The PROSYM model is a chronological dispatch computer model that dispatches resources
2 to meet demand requirements on an hourly basis. The model commits resources based on
3 fuel costs, unit start-up costs, and variable operation and maintenance ("O&M") costs after
4 accounting for operational characteristics of a utility system that may override economic
5 dispatch. Electric production is modeled at the generation unit level while system loads are
6 modeled on an hourly basis.

7 Q. IS THE PROSYM MODEL AN ACCEPTED PRODUCTION COST MODEL IN THE
8 ENERGY INDUSTRY?

9 A. According to material on Henwood's PROSYM web page, the model is "currently being
10 used by more than 120 companies on five continents." It goes on to say, "For the past fifteen
11 (15) years, the model has been proven in the most exacting forums such as utility rate
12 filings, litigation hearings, and bond financings."

13 Q. DESCRIBE EMPIRE'S EXPERIENCE WORKING WITH THE PROSYM MODEL.

14 A. Empire has been using chronological production costing models for projection purposes
15 since 1991. Empire's previous two rate case filings in Missouri utilized the PROSYM
16 model.

17 Q. HOW DOES EMPIRE VALIDATE THE OUTPUT OF PROSYM?

18 A. Empire compares the generation output of the model with actual historical generation for
19 each unit. The dispatch of Empire's thermal units falls within a reasonable range of
20 historical generation. Historical generation of Empire's units is attached to my direct
21 testimony as Schedule BPB-3.

22 Q. WHAT WAS THE ENERGY REQUIREMENT THAT WAS USED TO CALCULATE
23 FUEL AND PURCHASED POWER EXPENSE?

24 A. The energy requirement was forecasted based on normalized weather and projected
25 customers as of December 31, 2002. Total on-system energy requirements were assumed to
26 be 4,844,400 MWh's.

1 Q. WHAT ARE THE VARIABLES THAT DRIVE THE ENERGY COSTS ON EMPIRE'S
2 SYSTEM?

3 A. Key variables include transmission cost and availability, coal and natural gas prices,
4 purchased power prices and availability, planned and forced outages of thermal units,
5 weather, heat rates, and water availability for the Ozark Beach hydro unit.

6 Q. HOW WAS THE NEW STATE LINE COMBINED CYCLE UNIT ("SLCC") MODELED?

7 A. Empire owns 300 MW (60 percent) of the 500 MW combined cycle unit. For this rate case
8 filing SLCC was modeled as a single 300 MW unit with a heat rate based on the actual
9 performance of the unit during its operational period in 2001. The heat rate curve for SLCC
10 is relatively flat, with a maximum heat rate of approximately 8,000 Btu/kWh when
11 operating in a 1 x 1 mode (1 gas turbine and the steam turbine) and a minimum heat rate of
12 approximately 6,900 Btu/kWh when operating at full load in a 2 x 1 mode (2 gas turbines
13 and the steam turbine). The average heat rate during 2001 was about 7,300 Btu/kWh and
14 was utilized in the modeling for this filing.

15 Q. HOW WAS THE OZARK BEACH HYDRO UNIT MODELED?

16 A. Ozark Beach was modeled based on the average of the past thirty (30) years' historical
17 capacity factors for the units with consideration being taken for normalized outages. Hydro
18 generation accounts for less than 1.5 percent of NSI.

19 Q. ARE THERE ANY OPERATING CHARACTERISTICS FOR EMPIRE'S ASBURY
20 UNITS WHICH NEED SPECIAL CONSIDERATION?

21 A. Yes. Asbury is comprised of one boiler and two turbines. The Asbury Unit 1 turbine is rated
22 at 193 MW and Asbury Unit 2 is rated at 20 MW. Asbury Unit 2 cannot operate while
23 Asbury Unit 1 is off. In addition, Asbury is not able to run on a continuous basis at 213 MW
24 due to operational issues. Specifically, the upper convection passes in the furnace tend to
25 plug with ash. This operational limitation combined with Unit 2 operating costs causes
26 Empire to operate Unit 2 as a peaking unit that is normally only utilized during the summer
27 months. These constraints have been taken into consideration in the PROSYM model.

1 Q. ARE THERE ANY OPERATING CHARACTERISTICS FOR EMPIRE'S RIVERTON
2 UNITS WHICH NEED SPECIAL CONSIDERATION?

3 A. Yes. Riverton Unit 7 can operate to approximately 26 MW out of its 38 MW of rated
4 capacity on coal fuel alone. The remainder of the Riverton Unit 7 capacity can only be
5 obtained by over-firing natural gas. Likewise, Riverton Unit 8 can operate to approximately
6 45 MW out of its 53 MW rated capacity on coal fuel alone with the remainder of the
7 capacity obtained by over-firing natural gas. These coal-fired limitations have been modeled
8 in PROSYM.

9 Q. HOW WERE THE FORCED OUTAGE RATES USED IN THE BASE RUN
10 DETERMINED?

11 A. Empire tracks historical forced outage rates for its units. These historical rates are attached
12 to my direct testimony as Schedule BPB-4. The historical forced outage rates served as a
13 basis for the forced outage rates used in the model for all Empire units except SLCC.
14 Because of SLCC's limited operational history, a forced outage rate was used that is
15 representative of similar units in the industry.

16 Q. HOW WERE PLANNED OUTAGE SCHEDULES USED IN THE BASE RUN
17 DETERMINED?

18 A. The planned outage schedules are based on the average of the actual scheduled maintenance
19 days from the past five (5) years (1997-2001) with adjustment to the combustion turbine
20 units, SLCC, and Jeffrey Energy Center ("JEC") using North American Electric Reliability
21 Council ("NERC") Generating Availability Data System ("GADS") statistics as a guide. The
22 planned outage schedule is attached as Schedule BPB-5. NERC GADS data (averages from
23 1995 - 1999) was used as a guide because of limited information about the historical
24 maintenance schedule of SLCC and JEC and to account for large variations in historical
25 combustion turbine unit outage information. The use of NERC GADS data allows Empire to
26 be held accountable to industry average scheduled maintenance.

27 Q. WHAT COAL BLEND RATES ARE USED IN THE MODEL?

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1 A. On a million British thermal unit ("MMBtu") basis, Iatan uses 100 percent ARCO coal,
2 Riverton Unit 7 uses 75 percent Peabody coal and 25 percent blend coal, Riverton Unit 8
3 uses 100 percent Peabody coal, and Asbury uses 81 percent Peabody coal and 19 percent
4 blend coal.

5 Q. WHAT IS THE BASIS FOR THE COAL COSTS INCLUDED IN THE BASE RUN?

6 A. All costs are based on current delivered initial and freight prices. Coal handling costs are
7 added to the initial and freight costs to obtain the appropriate coal cost to include in the
8 model. Costs for unit train operation were added after the model run and are attached as
9 Schedule BPB-6.

10 Q. WHAT IS THE BASIS FOR THE GAS COSTS INCLUDED IN THE BASE RUN?

11 A. Delivered natural gas costs consist of two components – commodity and transportation.
12 Natural gas commodity prices are based on the monthly average prices Empire has hedged
13 for the year 2002. Firm transportation costs are contracted and total \$4,106,000 for the test-
14 year.

15 Q. WHAT IS THE BASIS FOR THE HEAT RATES UTILIZED IN THE BASE RUN?

16 A. Multi-step heat rates are input for each unit such that the final output heat rate for each unit
17 is near the historical five-year average heat rate for the unit. This is true for all units except
18 SLCC, which was explained earlier. Historical heat rates for Empire's units are attached to
19 my direct testimony as Schedule BPB-7.

20 Q. HOW WAS THE COST OF THE JEC CONTRACT PURCHASE ENERGY
21 DETERMINED?

22 A. The JEC contract energy purchase price is based on the actual cost of the energy out of the
23 three JEC coal units. The three JEC units were assigned planned outages based on NERC
24 GADS data (as previously explained) and unplanned outages as those modeled for the Iatan
25 plant, which is similar in size and age. The average energy cost in the base run is
26 \$13.50/MWh.

1 Q. DOES EMPIRE PARTICIPATE IN THE NON-CONTRACT PURCHASE ENERGY
2 MARKET?

3 A. Empire evaluates the non-contract energy purchase market on a daily and hourly basis.
4 Modeling non-contract purchased power can be a difficult task with the ever evolving and
5 uncertain price and availability of energy and transmissions.

6 The cost and availability of non-contract purchase power has always been a point of
7 disagreement among Commission Staff and the Company. The fact is, just like natural gas,
8 neither party can accurately predict future prices. There are simply too many variables like
9 transmission cost, transmission availability, coal prices, natural gas prices, planned and
10 forced outage rates, weather, heat rates, water availability, and market perception – all from
11 surrounding utilities and marketers other than Empire. It is variables such as these that make
12 the IEC tool one that is fair for the Company and the customer.

13 **IV. ADJUSTMENTS TO TEST YEAR FOR OPERATION AND MAINTENANCE**
14 **EXPENSES AT STATE LINE UNIT 1 AND ENERGY CENTER**

15 Q. DID EMPIRE MAKE ADJUSTMENTS TO THE OPERATION AND MAINTENANCE
16 EXPENSES IN THE TEST YEAR PERIOD BEFORE MAKING THIS RATE FILING?

17 A. Yes. We made adjustments surrounding the operation and maintenance expenses for SLCC,
18 Energy Center, State Line Unit 1, and Asbury.

19 Q. WHAT IS THE ADJUSTMENT FOR SLCC AND WHY IS IT NECESSARY?

20 A. The adjustment for SLCC is \$5,082,355. The adjustment is necessary because we do not
21 have a full year of history at SLCC. This adjustment nominally results in a level of expense
22 that is \$1 million higher than agreed to in Case No. ER-2001-299. The increase is due to a
23 contract with Missouri American Water Company for water supply to the plant and other
24 various changes that should be expected at a new facility.

25 Q. WHAT WAS THE ADJUSTMENT AND REASON FOR ADJUSTMENT FOR STATE
26 LINE UNIT 1?

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1 A. An adjustment of \$1,678,000 was made to reflect our predicted expenses at State Line Unit
2 1. The operations and maintenance expenses for State Line Unit 1 during the test year were
3 recorded at \$473,546. This adjustment nominally results in \$300,000 more than
4 contemplated in Case No. ER-2001-299 and is directly related to a planned generator
5 inspection that is expected to cost \$500,000. Generator inspections are recommended by the
6 manufacturer on a 3- to 5-year basis.

7 Q. ARE THERE SIMILAR CONCERNS FOR ENERGY CENTER O&M?

8 A. Yes. An adjustment of \$2,180,085 was made to reflect our predicted expenses at the Energy
9 Center. Actual test year expenditures total \$393,515 at the Energy Center. This adjustment
10 nominally results in \$400,000 more than the level of expense allowed in Case No. ER-2001-
11 299. The increase is due to a level of painting that has not been done in the recent past and
12 for parts for the Energy Center engines that are not included in the major maintenance
13 contract.

14 Q. WHAT ADJUSTMENT DID YOU MAKE FOR ASBURY AND WHY?

15 A. Asbury undergoes a major steam turbine inspection every five (5) years. Based on a
16 previous Missouri Commission order, the expenses associated with the turbine outage are
17 amortized and expensed over a 5-year period. The turbine outage that was completed in
18 1996 resulted in a yearly amortization of \$578,831 per year and this amount is included in
19 the test year. The amortization associated with the 2001 Asbury turbine outage is currently
20 estimated to be \$814,992 for the period 2002 through 2006. This results in an adjustment of
21 \$236,161.

22 Q. DOES THIS CONCLUDE YOUR DIRECT TESTIMONY?

23 A. Yes, at this time.

Schedule BPB-1
February 18, 2002

Empire District Electric
Gas Position Summary as of February 18, 2002

| | February 2002 | March 2002 | April 2002 | May-Dec 2002 | Year 2003 | Year 2004 | Year 2005 | Net All Years |
|-----------------------------|------------------|---------------|---------------|-----------------|-----------|-----------|-----------|------------------|
| Dth Hedged | 569,992 | 200,000 | 200,000 | 6,892,005 | 8,100,000 | 6,000,000 | 0 | 21,961,997 |
| Average Cost per Dth Hedged | 3.78 | 5.40 | 3.05 | 2.87 | 3.20 | 3.24 | 0 | 3.14 |

Total Company

Base

Top of Collar

| | | |
|--------------------------------|-------------|-------------|
| Price \$/MWH | 18.35 | 20.82 |
| MWH | 4,844,400 | 4,844,400 |
| Fuel & Purchased Power | 88,899,674 | 100,847,184 |
| Capacity Charge on purchase | 16,193,520 | 16,193,520 |
| Fuel & Purchased Power Expense | 105,093,194 | 117,040,704 |
| MWH | 4,844,400 | 4,844,400 |
| Price \$/MWH | 21.69 | 24.16 |

Missouri Retail

alloc. fac.

| | | |
|--------------------------------------|---------------|---------------|
| 0.819486 Fuel & Purchased Power | 72,852,038 | 82,642,855 |
| 0.811153 Capacity Charge on Purchase | 13,135,422 | 13,135,422 |
| Fuel & Purchased Power Expense | 85,987,461 | 95,778,278 |
| Retail kWh Sales | 3,661,131,298 | 3,661,131,298 |
| Price \$/MWH | 0.0235 | 0.0262 |
| | | 0.00267 |

THE EMPIRE DISTRICT ELECTRIC COMPANY

GENERATION HISTORY
1992 - 2000 ACTUALS (MWH)

| | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 |
|-----------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| ASBURY 1 NSO | 1,251,235 | 1,301,016 | 1,280,956 | 1,268,597 | 1,077,246 | 1,318,692 | 1,168,703 | 1,303,051 | 1,265,786 | 961,968 |
| ASBURY 2 NSO | 94,478 | 81,591 | 86,814 | 48,573 | 12,611 | 4,352 | 14,804 | 3,661 | 19,370 | 6,976 |
| TOTAL ASBURY NSO | 1,345,713 | 1,382,607 | 1,367,770 | 1,317,170 | 1,089,857 | 1,323,044 | 1,183,507 | 1,306,712 | 1,285,156 | 968,944 |
| IATAN NSO | 555,326 | 483,378 | 644,571 | 622,498 | 651,533 | 598,343 | 596,356 | 607,672 | 486,658 | 542,113 |
| RIVERTON 7 NSO | 141,635 | 167,388 | 185,307 | 136,046 | 181,724 | 156,838 | 173,649 | 167,577 | 149,460 | 171,562 |
| RIVERTON 8 NSO | 265,768 | 281,353 | 294,735 | 298,731 | 307,948 | 294,689 | 274,591 | 296,169 | 272,573 | 286,793 |
| RIVERTON PEAK NSO | 4,684 | 38,041 | 50,989 | 71,097 | 70,671 | 25,000 | 20,467 | 36,077 | 22,197 | 34,651 |
| TOTAL RIVERTON NSO | 412,087 | 486,782 | 531,031 | 505,874 | 560,343 | 476,527 | 468,707 | 499,823 | 444,230 | 493,006 |
| TOT ENERGY CENTER NSO | (224) | 9,514 | 3,041 | 52,132 | 59,517 | 66,204 | 141,026 | 77,854 | 102,574 | 114,898 |
| STATE LINE 1 NSO | | | | 46,826 | 32,491 | 43,729 | 115,004 | 118,302 | 180,111 | 53,316 |
| STATE LINE 2 NSO | | | | | | 76,939 | 163,020 | 288,107 | 150,796 | (23) |
| STATE LINE CC NSO* | | | | | | | | | | 588,151 |
| TOTAL STATE LINE NSO | | | | 46,826 | 32,491 | 120,668 | 278,024 | 406,409 | 330,907 | 641,444 |
| TOTAL THERMAL NSO | 2,312,902 | 2,362,281 | 2,546,413 | 2,544,500 | 2,393,741 | 2,584,786 | 2,667,620 | 2,898,470 | 2,649,525 | 2,760,405 |
| OZARK BEACH NSO | 77,644 | 102,673 | 83,556 | 71,302 | 62,860 | 77,578 | 70,631 | 86,349 | 51,132 | 53,635 |
| TOTAL EDE NSO | 2,390,546 | 2,464,954 | 2,629,969 | 2,615,802 | 2,456,601 | 2,662,364 | 2,738,251 | 2,984,819 | 2,700,657 | 2,814,040 |
| PURCHASES NSI NET | 767,572 | 1,094,643 | 1,092,858 | 1,324,173 | 1,763,827 | 1,642,642 | 1,764,294 | 1,517,368 | 2,255,776 | 2,093,045 |
| INADVERTANT | 19 | (44) | 130 | 651 | (507) | 998 | (1,474) | 307 | (555) | (354) |
| NSI REQUIREMENT | 3,151,977 | 3,552,901 | 3,720,515 | 3,937,177 | 4,204,598 | 4,250,155 | 4,471,314 | 4,472,922 | 4,794,585 | 4,800,756 |
| GENERATION SALES | 6,160 | 6,652 | 2,442 | 3,449 | 15,323 | 55,849 | 29,757 | 29,572 | 161,293 | 105,975 |

*For Empire's 300 MW Share of Capacity

THE EMPIRE DISTRICT ELECTRIC COMPANY

FORCED OUTAGE RATES

| | Asbury 1 | Asbury 2 | Iatan 1 | Riverton 7 | Riverton 8 | Riverton 9 |
|---------|----------|----------|---------|------------|------------|------------|
| 1997 | 2.24% | 27.40% | 4.89% | 0.71% | 0.77% | 2.63% |
| 1998 | 8.84% | 30.05% | 10.81% | 0.57% | 2.09% | 1.63% |
| 1999 | 0.87% | 3.82% | 7.71% | 1.48% | 0.03% | 0.27% |
| 2000 | 3.70% | 29.43% | 0.00% | 1.67% | 0.76% | 2.98% |
| 2001 | 6.46% | 26.54% | NA | 0.02% | 2.99% | 27.57% |
| 5-YR | | | | | | |
| Average | 4.42% | 23.45% | 5.85% | 0.89% | 1.33% | 7.02% |

| | | | | | | |
|-----------------------|--------------|---------------|--------------|--------------|--------------|--------------|
| Normalized Run | 5.00% | 20.00% | 6.50% | 1.50% | 1.50% | 5.00% |
|-----------------------|--------------|---------------|--------------|--------------|--------------|--------------|

| | Riverton 10 | Riverton 11 | EC 1 | EC 2 | State Line 1 | *SLCC |
|---------|-------------|-------------|--------|--------|--------------|--------|
| 1997 | 3.13% | 70.63% | 28.40% | 13.54% | 0.39% | 43.56% |
| 1998 | 4.26% | 62.56% | 4.65% | 7.22% | 2.60% | 60.62% |
| 1999 | 16.82% | 5.45% | 0.72% | 1.07% | 38.96% | 7.16% |
| 2000 | 13.60% | 0.10% | 2.99% | 9.93% | 8.71% | 0.00% |
| 2001 | 0.38% | 0.86% | 24.12% | 13.38% | 30.20% | 4.78% |
| 5-YR | | | | | | |
| Average | 7.64% | 27.92% | 12.17% | 9.03% | 16.17% | 23.22% |

| | | | | | | |
|-----------------------|--------------|--------------|--------------|--------------|--------------|----------------|
| Normalized Run | 5.00% | 5.00% | 7.50% | 7.50% | 7.50% | **7.50% |
|-----------------------|--------------|--------------|--------------|--------------|--------------|----------------|

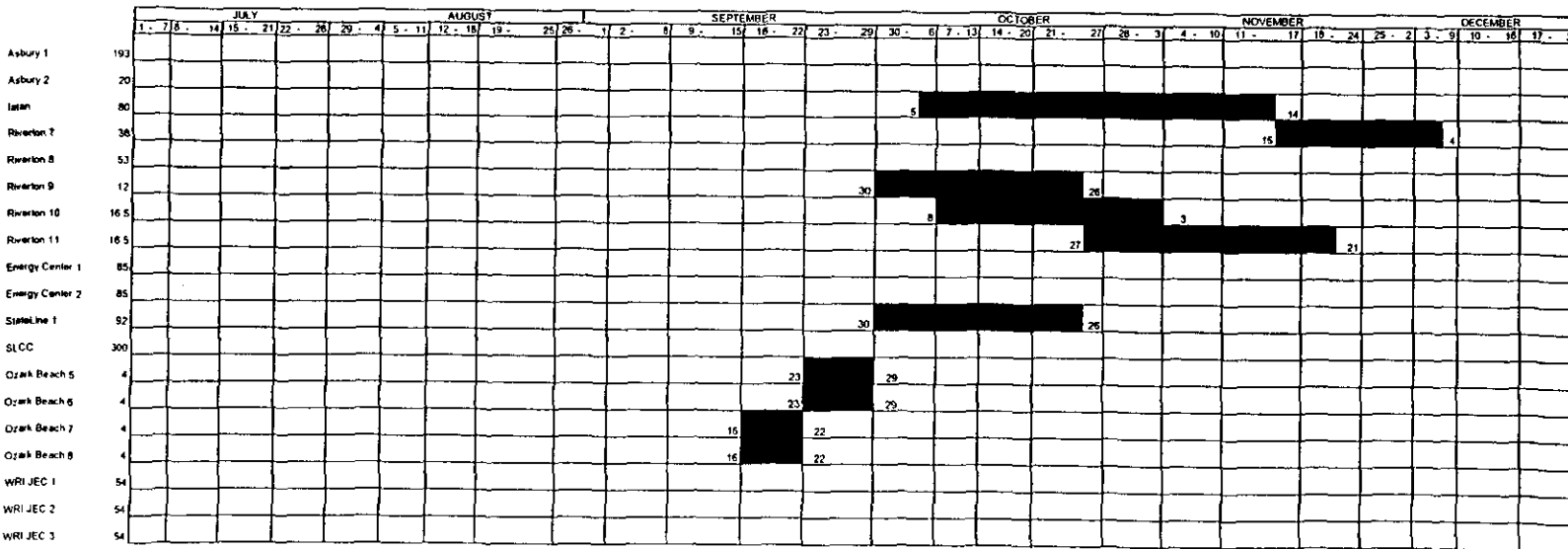
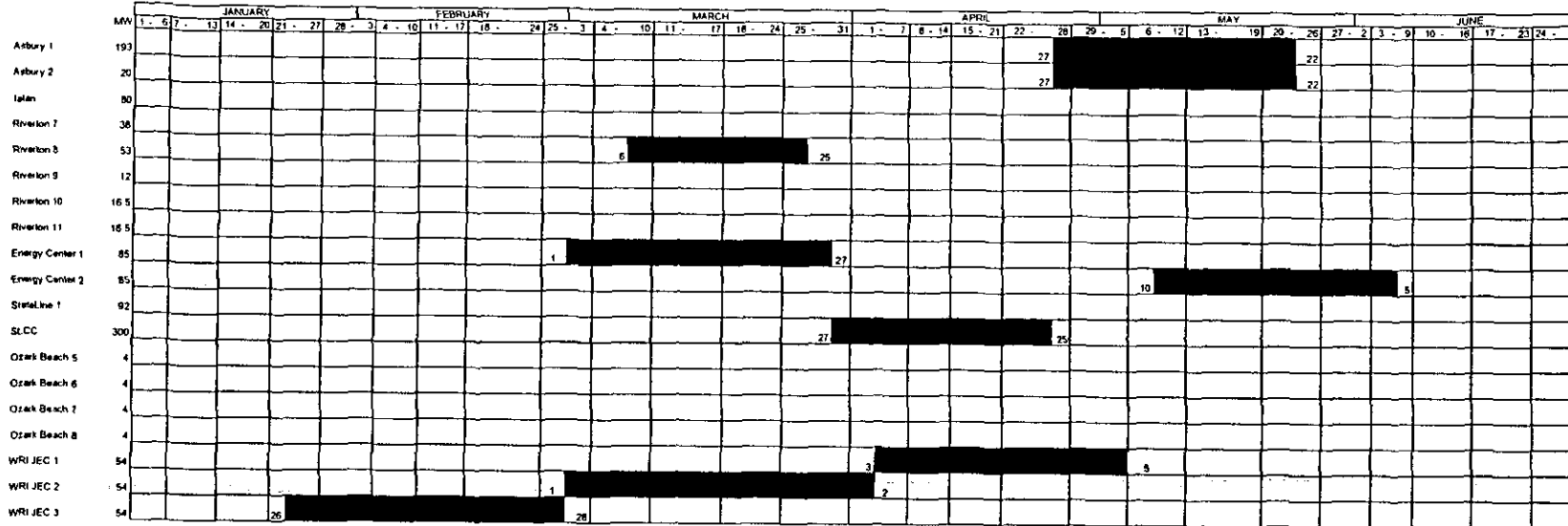
* Forced Outage Rates are actual for State Line 2 prior to Combined Cycle operation

**Forced Outage Rate for SLCC as a whole

PLANNED MAINTENANCE DAYS
NORMALIZED

Schedule B-5
February 19, 2002

WEEK IS MONDAY THRU SUNDAY



| Unit(s) | Dates | Days | Description |
|---------------|-----------------|------|-------------|
| ASBURY 1 | Apr 27 - May 22 | 26 | Normal Mice |
| ASBURY 2 | Apr 27 - May 23 | 26 | Normal Mice |
| RIVERTON 7 | Nov 15 - Dec 4 | 20 | Normal Mice |
| RIVERTON 8 | Mar 6 - Mar 25 | 20 | Normal Mice |
| RIVERTON 9 | Sep 30 - Oct 26 | 27 | Normal Mice |
| RIVERTON 10 | Oct 8 - Nov 3 | 27 | Normal Mice |
| RIVERTON 11 | Oct 27 - Nov 21 | 27 | Normal Mice |
| EC 1 | Mar 1 - Mar 27 | 27 | Normal Mice |
| EC 2 | May 10 - June 5 | 27 | Normal Mice |
| STATE LINE 1 | Sep 30 - Oct 26 | 27 | Normal Mice |
| IATAN | Oct 5 - Nov 14 | 30 | Normal Mice |
| WRI JEFFREY 1 | Apr 3 - May 5 | 33 | Normal Mice |
| WRI JEFFREY 2 | Mar 1 - Apr 2 | 33 | Normal Mice |
| WRI JEFFREY 3 | Jan 26 - Feb 28 | 33 | Normal Mice |
| Ozark Beach 5 | Sep 23 - Sep 29 | 7 | Normal Mice |
| Ozark Beach 6 | Sep 23 - Sep 29 | 7 | Normal Mice |
| Ozark Beach 7 | Sep 16 - Sep 22 | 7 | Normal Mice |
| Ozark Beach 8 | Sep 16 - Sep 22 | 7 | Normal Mice |
| SLCC | Mar 27 - Apr 25 | 30 | Normal Mice |

THE EMPIRE DISTRICT ELECTRIC COMPANY

| Unit Train and Other Fuel Related Costs | |
|---|---------|
| Iatan Unit Train Cost | 195,900 |
| Iatan Train Property Tax | 6,396 |
| EDE Lease Credit | (1,745) |
| EDE Train Depreciation | 316,404 |
| EDE Train Property Tax | 39,815 |
| Total Train & Railroad Maintenance | 170,197 |
| Total Fuel Related Costs | 556,770 |

THE EMPIRE DISTRICT ELECTRIC COMPANY

Heat Rate History

| Energy Generation and Fuel Usage | | | | | | | | | | |
|----------------------------------|-----------|------------|-----------|------------|-----------|------------|-----------|------------|---------|------------|
| | 1997 | | 1998 | | 1999 | | 2000 | | 2001 | |
| | MWHS | MMBTUs | MWHS | MMBTUs | MWHS | MMBTUs | MWHS | MMBTUs | MWHS | MMBTUs |
| Total Asbury | 1,323,044 | 14,514,353 | 1,183,507 | 13,240,584 | 1,306,712 | 14,585,891 | 1,283,152 | 14,734,088 | 968,944 | 10,918,795 |
| Iatan | 598,343 | 6,029,178 | 596,356 | 5,985,049 | 607,672 | 6,133,352 | 486,658 | 5,010,864 | 542,113 | 5,340,149 |
| Riverton 7 | 156,838 | 2,031,344 | 173,649 | 2,250,190 | 167,577 | 2,140,821 | 151,343 | 1,889,091 | 171,562 | 2,200,242 |
| Riverton 8 | 294,689 | 3,519,218 | 274,591 | 3,259,356 | 296,169 | 3,488,230 | 276,341 | 3,419,980 | 286,793 | 3,485,381 |
| Riverton 9 | 8,193 | 147,257 | 4,998 | 92,167 | 18,204 | 339,071 | 11,750 | 212,732 | 13,775 | 251,517 |
| Riverton 10 | 14,663 | 254,869 | 10,158 | 194,797 | 13,892 | 247,822 | 7689 | 139,910 | 18,570 | 341,125 |
| Riverton 11 | 2,144 | 37,795 | 5,311 | 107,701 | 3,981 | 73,235 | 2,758 | 50,956 | 2,306 | 43,536 |
| Energy Center 1 | 35,022 | 536,000 | 86,617 | 1,383,185 | 44,508 | 702,015 | 52,460 | 828,465 | 63,133 | 1,084,656 |
| Energy Center 2 | 31,182 | 480,503 | 54,409 | 875,170 | 33,346 | 533,904 | 50,114 | 797,591 | 51,765 | 810,272 |
| State Line 1 | 43,729 | 549,271 | 115,004 | 1,487,924 | 118,302 | 1,460,046 | 180,111 | 2,346,595 | 53,316 | 616,434 |
| State Line 2 | 76,939 | 984,225 | 163,020 | 1,969,901 | 288,107 | 3,524,444 | 150,796 | 1,965,286 | NA | NA |
| State Line CC | NA | NA | NA | NA | NA | NA | NA | NA | 588,151 | 4,113,108 |

| Heat Rates | | | | | |
|-----------------|--------|--------|--------|--------|--------|
| | 1997 | 1998 | 1999 | 2000 | 2001 |
| Total Asbury | 10,970 | 11,188 | 11,162 | 11,483 | 11,269 |
| Iatan | 10,076 | 10,036 | 10,093 | 10,296 | 9,851 |
| Riverton 7 | 12,952 | 12,958 | 12,775 | 12,482 | 12,825 |
| Riverton 8 | 11,942 | 11,870 | 11,778 | 12,376 | 12,153 |
| Riverton 9 | 17,974 | 18,441 | 18,626 | 18,105 | 18,259 |
| Riverton 10 | 17,382 | 19,177 | 17,839 | 11,907 | 18,370 |
| Riverton 11 | 17,628 | 20,279 | 18,396 | 18,476 | 18,879 |
| Energy Center 1 | 15,305 | 15,969 | 15,773 | 15,792 | 17,180 |
| Energy Center 2 | 15,410 | 16,085 | 16,011 | 15,916 | 15,653 |
| State Line 1 | 12,561 | 12,938 | 12,342 | 13,029 | 11,562 |
| State Line 2 | 12,792 | 12,084 | 12,233 | 13,033 | NA |
| State Line CC | NA | NA | NA | NA | 6,993 |

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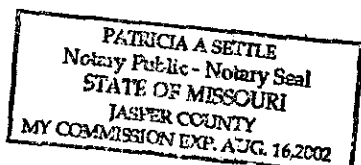
STATE OF MISSOURI)
) ss
COUNTY OF JASPER)

On the 25th day of February, 2002, before me appeared Brad P. Beecher, to me personally known, who, being by me first duly sworn, states that he is the Vice President – Energy Supply of The Empire District Electric Company and acknowledged 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.

Brad P. Beecher

Brad P. Beecher

Subscribed and sworn to before me this 25th day of February, 2002



Patricia A. Settle

Patricia A. Settle, Notary Public

My commission expires: August 16, 2002