Exhibit No.:	
Issues:	Fuel Model; Purchase Power
Witness:	Leon C. Bender
Sponsoring Party:	MoPSC
Type of Exhibit:	Direct Testimony
Case No.:	ER-2001-299
Date Testimony Prepared:	April 3, 2001

MISSOURI PUBLIC SERVICE COMMISSION

UTILITY OPERATIONS DIVISION

DIRECT TESTIMONY

OF

LEON C. BENDER

THE EMPIRE DISTRICT ELECTRIC COMPANY

CASE NO. ER-2001-299

Jefferson City, Missouri
April, 2001

DIRECT TESTIMONY

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THE EMPIRE DISTRIC ELECTRIC COMPANY

CASE NO. ER-2001-299

Q. Please state your name and business address.

A. Leon C. Bender, P.O. Box 360, Jefferson City, Missouri, 65102.

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

A. I am employed by the Missouri Public Service Commission (MoPSC or Commission) as a Regulatory Engineer in the Electric Department of the Utility Operations Division.

Q. Please describe your educational and work background.

A. I received a Bachelor of Science degree in Mechanical Engineering in August 1978 from Texas Tech University. I was employed by Southwestern Public Service Company (SPS) as a power generation plant design engineer in September 1978. While employed by SPS, I was lead engineer on many projects involving design and construction of new power generating stations and upgrading of their older plants. In 1983, I became a registered Professional Engineer in the state of Texas. In 1986, I transferred to SPS's newly formed subsidiary company, Utility Engineering Corporation (UEC), and was responsible for various projects at various other client's power generation plants. In June 1990, I accepted employment as a systems engineer with Entergy Operations, Inc. at the nuclear powered generating station, Arkansas Nuclear One. In December 1995, I was employed by the Missouri Public Service Commission.

Q. What is the purpose of your testimony in this case, the Empire District Electric Company (EDE) rate case, Case No. EM-2001-299?

A. The purpose of my testimony is to present the results of the Staff's electric production cost model simulation that is used to establish a reasonable fuel and purchased power cost for EDE for the test year.

Q. Briefly summarize the results of the production cost model simulation.

A. The results of the production cost model simulation, as shown in Schedule 1, show that the annual cost of fuel and net purchase power for the test year is $76,871,370.

Q. What test year did Staff use?

A. January 1, 2000 to December 31, 2000.

Q. What is a production cost model?

A. A production cost model is a computer program used to perform an hour-by-hour chronological simulation of a utility's generation and power purchases. The model determines energy costs and fuel consumption necessary to economically meet a utility's load.

Q. What is meant by an "hour-by-hour" chronological simulation of a utility's generation and net power purchases?

A. The production cost model operates in a chronological fashion, meeting each hour's energy demand before moving to the next hour. It will schedule generating units to dispatch in a least cost manner based upon fuel cost and the cost of purchased power. This model closely simulates the way the company should dispatch its generating units and purchase power to meet the net system load in a least cost manner.

Q. What production cost model did the Staff use in this case?

A. The RealTime production cost model was used. This is the same model used by Staff in all other electric rate cases since 1995.

Q. What were the sources for data used in the model?

A. The sources for data used in the model are listed in Schedule 2.

Q. Did you simulate the operation of any generation units that were not operating at the time of this filing of direct testimony?

A. Yes, the simulation included the State Line Unit 2, which, at this time is shut down to convert it to the State Line Combined Cycle Unit (SLCC). It is included in the simulation because it was in service until September of 2000.

Q. Was the SLCC modeled?

A. No, the SLCC was not modeled in this simulation. Since SLCC is not in operation at this time and has no operating history, Staff did not model the SLCC in its production cost model. The effect of this unit upon fuel cost and purchased power will be addressed during the true-up process.

Q. What is purchased power?

A. Purchased power is the hourly energy which is purchased in the market place from another electric supplier and which is used to meet the load of the electric utility company.

Q. Does EDE need purchased power to serve native load?

A. Yes. During times of plant forced or planned outages, or during times when it is more economical to use purchased power rather than generate power, EDE needs purchased power.

Q. What were the sources for data used to calculate purchased power prices and energy?

A. The data used to calculate purchased power prices and energy were submitted to Staff by EDE as required by Commission Rule 4 CSR 240-20.80 (20.080 data). Staff submitted Data Request No 2916 to verify the purchased power information supplied by Empire on the 20.080 data. Staff witness William Harris also provided historical information on purchased power costs.

Q. What different kinds of purchased power were used in the production cost model?

A. Two kinds of purchased power were used in the production cost model; capacity and spot purchased power.

Q. Please explain what is meant by capacity purchases.

A. Capacity purchases are made through capacity contracts for the purchase of power where the purchaser pays a fixed cost for the ability to receive a maximum number of megawatts (MW) per hour and also pays a variable cost for MW hours of the energy associated with the generating capacity that is being purchased. The purchasing company can obtain a quantity of hourly energy up to the maximum amount shown in the capacity contract. The fixed costs are not included in the model results.

Q. How many capacity purchase contracts were used in the model?

A. A list of the three existing purchase contracts used in the production cost model is provided in Schedule 2.

Q. How did you calculate the hourly prices for each capacity contract?

A. I used historical prices obtained from 20.080 data. The prices were fixed for each hour of every month regardless of amount of energy purchased up to the contract maximum. Prices varied monthly.

Q. What are spot market purchases?

A. For the purposes of this case, spot market purchases are transactions for energy on an hourly basis for a short period of time. The purchasing company can buy energy from one or more suppliers based on its own economic decisions. Since the spot market purchases depend on energy supply and demand, the prices are more volatile than capacity purchases. Spot market purchases are generally made to meet unanticipated energy need, or to take advantage of relatively lower energy prices.

Q. What methodology did you use to determine the spot market purchased energy prices?

A. I used a procedure developed by the Commission's Electric Department-Engineering Section described in the document entitled A Methodology to Calculate Representative Prices for Purchased Energy in the Spot Market. The method uses a statistical calculation based on the truncated normal distribution curve to represent the hourly purchased power prices in the spot market. EDE's actual hourly non-contract transaction prices obtained from EDE's 20.080 data are used as input in the calculation.

Q. How did you determine spot purchased energy available in hours that had no purchased energy?

A. I estimated the hourly spot purchased energy based upon the amount of energy that was purchased in the same hours of days that had a similar price range. The Staff's

production cost model calculates the amount of energy to purchase based upon least cost basis to meet load.

Q. What is the test year cost, of fuel and net purchased power, as determined by the Staff's production model for EDE?

A. The test year fuel cost, including net purchased power, determined for the test year is $76,871,370. This amount was supplied to Staff witness William Harris, who used this input in the annualization of fuel expense. For further discussion of how Staff annualized the overall fuel expense in this case, please see staff witness William Harris's direct testimony.

Q. Does Staff anticipate the need to true-up the production cost model in this case?

A. Yes. The Commission has authorized an update of the test year through June 30, 2001. Consequently, Staff will have to identify the inputs to the model, which require updating for the true-up filing on August 7, 2001. Assuming the SLCC is in-service, the model will be modified to include EDE's share of the SLCC rather than the existing State Line Unit 2 that is currently in the model. In addition, the two capacity contracts that Staff has included in its current fuel expense calculation that expire on May 31, 2001, will be removed. Also, fuel Prices and purchase power prices will be updated through June 30, 2001 in the true-up.

Q. Does this conclude your direct testimony?

A. Yes, it does.

BEFORE THE PUBLIC SERVICE COMMISSION

OF THE STATE OF MISSOURI

IN THE MATTER OF THE	)	
APPLICATION OF THE EMPIRE	)	
DISTRICT ELECTRIC COMPANY FOR	)	
A GENERAL RATE INCREASE	)	Case No. ER-2001-299

AFFIDAVIT OF LEON C. BENDER

STATE OF MISSOURI)
) **ss**
COUNTY OF COLE)

Leon C. Bender, of lawful age, on his oath states: that he has participated in the preparation of the foregoing written testimony in question and answer form, consisting of 6 pages of testimony to be presented in the above case, that the answers in the attached written testimony were given by him; that he has knowledge of the matters set forth in such answers; and that such matters are true to the best of his knowledge and belief.

Leon C. Bender

Subscribed and sworn to before me this 3rd day of April, 2001.

Notary Public

My commission expires _____

DAWN L. HAKE
Notary Public – State of Missouri
County of Cole
My Commission Expires Jan 9, 2004

Schedule 1

Summary of Results of Staffs Production Cost Model

Totals		
Generation (energy (MWH))		2,550,613
Purchases (energy (MWH))		2,176,680
Total weather Normal Load		4,802,729
Fuel expenses (cost ($))	$	43,488,780
Purchases (cost ($))	$	32,015,760
Total expense (cost ($))	$	76,871,370
Average Cost ($/MWH)		16.01

Units	**Generation**		**Total Expense**	**Cost ($/MWH)**
ASBURY 1	1,159,030	$	13,955,440	12.04
ASBURY 2	2,023	$	39,040	19.30
ENERGY CTR 1	114,000	$	5,997,000	52.61
ENERGY CTR 2	86,660	$	4,656,920	53.74
IATAN 1	611,857	$	3,657,800	5.98
RIVERTON 10	6,726	$	410,610	61.05
RIVERTON 11	4,950	$	315,040	63.65
RIVERTON 7	137,576	$	2,077,410	15.10
RIVERTON 8	212,516	$	2,909,470	13.69
RIVERTON 9	8,185	$	584,540	71.42
STATE LINE 1	143,121	$	6,926,720	48.40
STATE LINE 2	63,971	$	3,325,620	51.99
Hydro Units		$	-	
OZARK BEACH	75,436	$	-	0.00
Purchases		$	-	
Spot Market Purchases	140,075	$	3,823,860	27.30
SPS Purchases (45MW)	169,152	$	3,661,930	21.65
Jeffrey Purchase (162MW)	1,268,794	$	15,969,060	12.59
Western Resources Purchase (80MW)	598,659	$	8,560,910	14.30
Total	4,802,729	$	76,871,370	16.01

Generating Units	Forced Outage Hours	5 Year Average
ASBURY 1	448	402
ASBURY 2	1188	1,201
ENERGY CTR 1	112	87
ENERGY CTR 2	75	73
IATAN 1	512	599
RIVERTON 10	140	149
RIVERTON 11	396	384
RIVERTON 7	91	74
RIVERTON 8	59	61
RIVERTON 9	14	22
STATE LINE 1	640	340
STATE LINE 2 *	1465	1,414
Total	5139	4,805

* State Line Two has not been in operation 5 years

Units		
Coal	2297	2,337
CC/GT	2842	2,469

Generating Units	Planned Outage Hours	5 Year Average
ASBURY 1	892	892
ASBURY 2	1044	1,044
ENERGY CTR 1	940	939
ENERGY CTR 2	1236	1,236
IATAN 1	438	439
RIVERTON 10	855	855
RIVERTON 11	258	258
RIVERTON 7	524	524
RIVERTON 8	644	645
RIVERTON 9	1606	160
STATE LINE 1	708	707
STATE LINE 2 *	168	2,170
Total	9313	9,869

* State Line Two has not been in operation 5 years

Units		
Coal	3542	3,544
CC/GT	5771	6,325

Schedule 2

Fuel Prices	Supplied by Staff William Harris
Unit Maintenance History	Supplied by Staff Witnesses William Harris EDE Response to Staff
Generation Unit Specific Data	DR 2915
Weather Normalized Hourly Load	Supplied by Staff Witness Lena Mantle
Purchase Power Contracts; Capacities and Prices	4CSR 240-20.80 data Southwestern Public Service Contract 45MW Western Resources- Jeffery Units 162 MW Kansas Gas and Electric 80 MW