Exhibit No.:
Issue: Jurisdictional Allocations, Distribution Allocations, Fuel Inventory Allocations, and System Energy Losses
Witness: Syed K. Ahmad
Sponsoring Party: MoPSC Staff
Case No.: ER-97-81

MISSOURI PUBLIC SERVICE COMMISSION

UTILITY OPERATIONS DIVISION

THE EMPIRE DISTRICT ELECTRIC COMPANY

CASE NO. ER-97-81

DIRECT TESTIMONY

OF

SYED K. AHMAD

Jefferson City, Missouri
February 1997

Denotes Highly Confidential Information

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OF

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THE EMPIRE DISTRICT ELECTRIC COMPANY

CASE NO. ER-97-81

Q. Please state your name and business address.

A. Syed K. Ahmad, P.O. Box 360, Jefferson City, MO 65102.

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

A. I am employed by the Missouri Public Service Commission (MPSC or Commission) as a staff engineer in the engineering section of the Utility Operation Division's Energy Department.

Q. Please describe your educational and professional background.

A. I hold a Bachelor of Science degree in electrical engineering from N.E.D. Engineering University of Karachi, Pakistan (1983), and a Master of Science degree in electrical engineering from the University of Saskatchewan of Saskatoon, Canada (1993).

After receiving my B.S., I worked as an electrical engineer one year for Pakistan Steel Mills, where I was involved in preparing electrical equipment & material specifications, performing bid evaluations and performing on site inspection/testing.

In December 1984, I joined Karachi Electric Supply Corporation, an electric power utility as an engineer-in-training. There I participated in a one year training program on electric power generation, transmission and distribution. After successful completion of the training program, I worked for four years as an electrical engineer in the transmission & distribution (T&D)

section of the utility. There I was involved in the planning, operation and maintenance of T&D facilities.

In June 1993, after receiving my M.S., I worked for a Texas-based corporation, Cartotech. This firm provides computer based services (AM/FM/GIS services) for North American utilities, municipalities, and other industries. I was involved in project implementation for data collection, data conversion and quality control for underground and overhead primary electrical distribution systems. Since August 1994, I have been employed by the Commission.

Q. Are you a member of any professional organization?

A. Yes, I am an Engineer-in-Training (EIT) under the laws of the State of Missouri and a member of the National and Missouri Society of Professional Engineers.

Q. What is the purpose of your testimony in this proceeding?

A. The purpose of this testimony is to a) select a jurisdictional allocation methodology, b) use the selected method to develop allocation factors, c) sponsor those allocation factors for use in the allocation of generation & transmission facilities, d) allocate the cost of distribution plant, e) allocate the cost of fuel inventory, and f) allocate the system energy losses.

Q. Please define "jurisdictional allocation".

A. As recognized in the National Association of Regulatory Utility Commissioners (NARUC) Allocation manual, " A utility that operates in both inter and intra state commerce will be regulated by both federal and state jurisdictions and any lack of consistency between the two regulatory bodies can lead to over-collection or under-collection of revenue by the utility." Thus, a jurisdictional allocation study is used to apportion the cost of generation and transmission assets, included in the Federal Energy Regulatory Commission (FERC) Uniform System of Accounts

(USOA) 310 - 346 for Generation and 350 - 358 for Transmission, between the jurisdictions served by The Empire District Electric Company (EDE or Company).

Q. Please identify the jurisdictions served by the Company.

A. EDE provides retail service in the States of Missouri, Kansas, Oklahoma, and Arkansas and wholesale service in Missouri and Kansas.

Q. What methodology have you used in performing your jurisdictional allocation?

A. I used the four coincident peak (4 CP) hour methodology.

Q. What is meant by CP?

A. It is the highest one hour demand, in megawatts (MW), occurring in a month.

Q. Why use peak demand as the basis for allocations?

A. Peak demand is the highest electric requirement occurring in a given period (e.g. a day, month, season, or year). For an electric system, it is equal to the sum of the metered net outputs of all generators within the Company's system plus the metered line flows into the system, less the metered line flows out of the system. Since generating units and transmission lines are designed and planned to meet the peak demand, the individual contribution to peak demand is the appropriate factor for the allocation of facilities costs. EDE monitors and logs the peak demand information for every hour of every day.

Q. Please describe the procedure for calculating the jurisdictional allocation factor.

A. The jurisdictional allocation factors are calculated by dividing the megawatts (MW) required in each jurisdiction during the CP hour by the MW used throughout the entire system during the same hour.

Q. What methodology has EDE used in this rate case?

A. They used the 12 CP method.

Q. What methodology was used by the Staff and EDE in the last Company's rate Case No. ER-95-279?

A. The Staff used 4 CP and EDE used 12 CP.

Load Analysis

Q. How did you decide to recommend the 4 CP method?

A. I performed three different analyses before selecting the use of the 4 CP method. *Analysis I*: Schedule 1 shows EDE's historical peak loads from October 1987 to September 1995 and the test year (i.e., October 1995 to September 1996) peak loads. The table in Schedule 1 represents the peak loads in MW, as a percentage of that year's annual peak (AP) and are averaged over the eight years. The load curve in Schedule 1 represents the comparison between the eight year average and the test year's actual monthly peak. It can be observed from the load curve of Schedule 1 that EDE's load peaks during the months of June, July, August and September and drops to a minimum in April or October.

Analysis II: Schedule 2 illustrates the relationship between ratios of the Company's lowest monthly peak demand to the Company's highest monthly peak demand. The table in Schedule 2 states the month of lowest peak demand, as a percentage of that year's AP demand, month of highest peak demand, as a percentage of that year's AP demand, and lowest monthly peak to highest monthly peak ratio. It can be seen from Schedule 2 that EDE experienced its lowest peak demand in the months of April, May and October, whereas the highest peak demand occurs in the months of July and August. Schedule 2 also shows that over the last nine years, EDE's minimum monthly demand has an average of **_____** of the maximum peak demand.

Analysis III: Schedule 3 shows the differential in growth between peak and off peak load. It can be noted from Schedule 3 that the Company's load averaged over the last nine years varies from peak season to off peak season by nearly **_____**.

Q. How was the load data gathered?

A. The load data for historical analysis and test year was taken from the data filed by EDE in compliance with 4 CSR 240-20.080.

Q. Please summarize the load analyses.

A. All three analyses described above reflect that EDE experienced definite peaks during the summer months of June, July, August and September of the test year, which strongly supports the 4 CP method.

Q. What are the allocation factors you have calculated for the jurisdictional allocation of Generation and Transmission (G&T) plant?

A. Schedule 4 represents the jurisdictional peak demands and the allocation factor for each jurisdiction. The jurisdictional demand data was provided by the Company and the system peak was verified with the 4 CSR 240-20.080 data. The resultant allocation factors for retail are: Missouri, **_____**; Kansas, **_____**; Oklahoma, **_____**; Arkansas, **_____**; and for wholesale they are: Missouri, **_____**; Kansas, **_____**.

Distribution Allocation

Q. Please describe how the distribution allocation were calculated in the previous EDE rate Case, No. ER-95-279, by the Staff?

A. The Staff utilized the "roll-in" method of allocating facilities as adopted by the FERC in transmission plant.

Q. What is the "roll-in" method?

A. The "roll-in" method relies on the functional characteristics of facilities. The "roll-in" procedure involves identifying equipment that is accounted for in FERC's USOA 360 - 369 (i.e. for distribution equipment), but serves or is capable of serving a "transmission" function. Once identified, the cost of these components is added or "rolled" into the total transmission accounts (i.e. USOA 350 - 359) and allocated among the jurisdictions based on the previously determined allocation factors.

Q. What did the Staff find in the previous EDE rate Case No. ER-95-279?

A. After the review and inspection of EDE's transmission and distribution system, Staff found that none of the distribution substations served or were capable of serving a transmission function. Staff, however, found that some of EDE's transmission substations contain distribution components that serve a distribution function, and therefore should be assigned to a local jurisdiction.

Q. What recommendation was made by the Staff in the previous rate case?

A. Staff recommended that costs should be taken out of USOA 353, added to USOA 362, and assigned to the jurisdiction it serves.

Q. Do you agree with the Staff approach in the previous EDE rate Case No. ER-95-279?

A. Yes.

Q. Do you recommend the same shifting of costs from USOA 353 to USOA 362 in this rate case?

A. Yes, I recommend the same shifting of costs be updated to the test year for this EDE rate Case, No. ER-97-81.

Q. What costs should be taken out of USOA 353, added to USOA 362, and assigned to the jurisdiction it serves?

A. An estimated cost of approximately **_____** in distribution equipment is residing in transmission substations and accounted for in USOA 353. My findings are, that of this amount approximately **_____** benefits Missouri retail customers, **_____** benefits Kansas retail customers, and **_____** benefits Arkansas retail customers. These costs are summarized in Schedule 5.

Q. Please describe Schedule 5.

A. Schedule 5 represents the allocation of distribution plant. The cost data for the distribution plant was provided by the Company and adjustments were made for the above stated costs. The allocation factors were calculated by dividing the cost of distribution equipment for a particular jurisdiction by the cost of distribution equipment for the entire system. The allocation factors calculated for the test year for retail are: Missouri, **_____**; Kansas, **_____**; Oklahoma, **_____**; Arkansas, **_____**. For wholesale, they are: Missouri, **_____**; Kansas, **_____**.

Q. What updates have you made to the test year distribution allocation factors?

A. At the request of Staff witness Jim Schwieterman of the Accounting Department, I updated the allocation factors to reflect the actual data through December 31, 1996. The updated distribution allocation factors for retail are: Missouri, **_____**; Kansas,

_____; Oklahoma, **_____**; Arkansas, **_____**; and for wholesale, they are: Missouri, **_____**; Kansas, **_____**.

Fuel Inventory Allocation

Q. Please describe how you calculated the fuel inventory allocation factors.

A. Fuel is classified as energy-related, as it is used to run a power plant at a specified power level for a specified period of time. Traditionally, kilowatt hour (KWH) sales per year in each jurisdiction has been the basis used for allocating fuel inventory. The allocation factors have been calculated by dividing the annual KWH sales in each jurisdiction by the total annual KWH sales for the Company.

Q. What are the fuel inventory allocation factors in this case?

A. The fuel inventory allocation factors were calculated using the traditional methodology and are stated in Schedule 6. For retail they are: Missouri, **_____**; Kansas, **____**; Oklahoma, **_____**; Arkansas, **_____**; and for wholesale, they are: Missouri, **_____**; Kansas, **_____**.

System Energy Losses

Q. What do you mean by energy losses?

A. It is the difference between the amount of electricity generated and the amount of electricity actually delivered to customers and collected for.

Q. What is system energy loss?

A. It is the total electric energy losses in the electric system. The losses consist of transmission, transformation, and distribution losses between supply sources and delivery points.

Q. How have you calculated the system energy losses in this case?

A. System energy losses are calculated by subtracting the test year sales and Company's usage from the Net System Input (NSI). This can be summarized in mathematical form as:

System Energy Losses = NSI - Sales - Company's usage

Q. What is the result of your calculation?

A. My results are stated in Schedule 6. The NSI (MWH), Total Sales (MWH), Company's usage (MWH) and Loss as a percentage of NSI is **____** of NSI for the test year under consideration (i.e., from October 1995 - September 1996).

Q. Please summarize your testimony.

A. I am sponsoring the following Missouri retail allocation factors: for G&T plant, **_____**; for distribution plant, **_____**; and for fuel inventory, **_____**. I am also sponsoring an energy loss factor of **_____** as a percentage of NSI. Finally, I am recommending that **_____** be transferred out of USOA 353 before the G&T allocation factor is applied to the total cost of G&T plant and **_____** of this amount be assigned to Missouri retail customers.

Q. Does this conclude your testimony?

A. Yes, it does.

SCHEDULE 1

DEEMED TO BE

HIGHLY CONFIDENTIAL

IN ITS ENTIRETY

SCHEDULE 2

DEEMED TO BE

HIGHLY CONFIDENTIAL

IN ITS ENTIRETY

SCHEDULE 3

DEEMED TO BE

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SCHEDULE 4

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SCHEDULE 5

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SCHEDULE 6

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BEFORE THE PUBLIC SERVICE COMMISSION

OF THE STATE OF MISSOURI

In the matter of The Empire District Electric Company of Joplin, Missouri, for authority to file tariffs increasing rates for electric service provided to customers in the Missouri service area of the Company.	)))))	Case No. ER-97-81

AFFIDAVIT OF SYED K. AHMAD

STATE OF MISSOURI)
) ss.
COUNTY OF COLE)

Syed K. Ahmad, of lawful age, on his oath states: that he has participated in the preparation of the foregoing Direct Testimony in question and answer form consisting of 9 pages and 6 schedules to be presented in the above case; that the answers in the foregoing Direct Testimony were given by him; that he has knowledge of the matters set forth in such answers; and that such matters are true and correct to the best of his knowledge and belief.

SYED K. AHMAD

Subscribed and sworn to before me this 11th day of February, 1997.

Notary Public

JOYCE C NEUNER
NOTARY PUBLIC STATE OF MISSOURI
OSAGE COUNTY
MY COMMISSION EXP JUNE 18,1997

My Commission Expires: