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| Exhibit No.: | |
| Issues: | Class Cost of Service |
| Witness: | Daniel I. Beck |
| Sponsoring Party: | MO PSC Staff |
| Type of Exhibit: | Direct Testimony |
| Case No.: | GR-2007-0003 |
| Date Testimony Prepared: | December 29, 2006 |

# MISSOURI PUBLIC SERVICE COMMISSION

# UTILITY OPERATIONS DIVISION

# DIRECT TESTIMONY

# OF

# DANIEL I. BECK

# UNION ELECTRIC COMPANY d/b/a AMERENUE

# CASE NO. GR-2007-0003

**Jefferson City, Missouri**
**December 2006**

**BEFORE THE PUBLIC SERVICE COMMISSION**

**OF THE STATE OF MISSOURI**

| | | |
|---|---|---|
| In the Matter of Union Electric Company d/b/a AmerenUE for Authority to File Tariffs Increasing Rates for Natural Gas Service Provided to Customers in the Company's Missouri Service Area. | ) ) ) ) ) | Case No. GR-2007-0003 |

**AFFIDAVIT OF DANIEL I. BECK**

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

Daniel I. Beck, of lawful age, on his oath states: that he has participated in the preparation of the following Direct Testimony in question and answer form, consisting of 5 pages of Direct Testimony to be presented in the above case, that the answers in the following Direct 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.

Daniel I. Beck

Subscribed and sworn to before me this 28th day of December, 2006.

SUSAN L. SUNDERMEYER
My Commission Expires
September 21, 2010
Callaway County
Commission #06942086

Notary Public

My commission expires 9-21-10

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**DANIEL I. BECK**

**UNION ELECTRIC COMPANY d/b/a AMERENUE**

**CASE NO. GR-2007-0003**

Q. Please state your name and business address.

A. My name is Daniel I. Beck and my business address is Missouri Public Service Commission, P. O. Box 360, Jefferson City, Missouri 65102.

Q. What is your present position with the Missouri Public Service Commission (MOPSC or Commission)?

A. I am employed by the Commission as the Supervisor of the Engineering Analysis Section, Energy Department, Utility Operations Division.

Q. Would you please review your educational background and work experience.

A. I graduated with a Bachelor of Science Degree in Industrial Engineering from the University of Missouri at Columbia. Upon graduation, I was employed by the Navy Plant Representative Office in St. Louis, Missouri as an Industrial Engineer. I began my employment at the Commission in November 1987, in the Research and Planning Department of the Utility Division (later renamed the Economic Analysis Department of the Policy and Planning Division) where my duties consisted of weather normalization, load forecasting, integrated resource planning, cost-of-service and rate design. In December 1997, I was transferred to the Tariffs/Rate Design Section of the Commission's Gas Department where my duties included weather normalization, annualization, tariff review, cost-of-service and rate design. Since June 2001, I have been in the Engineering Analysis Section of the

Energy Department, which was created by combining the Gas and Electric Departments. I am a Registered Professional Engineer in the State of Missouri. My registration number is E-26953.

## EXECUTIVE SUMMARY

Q. What is the purpose of your direct testimony?

A. The purpose of my direct testimony is to explain the procedures used for the development of allocation factors for mains, services, meters and regulators. In addition, I will discuss the peak demands used by Staff for allocation of costs.

## ALLOCATION OF MAINS

Q. What allocation factor was used for mains?

A. I used a capacity utilization factor to allocate mains to the classes.

Q. Why is utilization of capacity an appropriate basis for allocating the cost of mains?

A. Mains are an integrated system of pipes that provide service to customers to the degree that the capacity of that system is utilized. While the diameters of the pipes used in that system are sized to carry sufficient volumes to meet peak day demands, the value to the customer from the system occurs throughout the year, not just on the peak day. The allocation of the cost of mains should reflect the total value that customers derive from the service throughout the year. Utilization of the capacity of mains is a reasonable way of measuring how the various classes of customers benefit from that portion of the local distribution system.

Q. How did you measure the capacity utilization of mains?

A. First, the relative amount of capacity utilized in each month of the year is calculated. Then, in each month that relative amount of capacity is allocated to the classes

based on their contribution to the monthly peak demand. These allocations are added over all twelve months to derive the annual capacity utilization of each class.

The calculation of the relative amount of capacity utilized in each month is made by ranking the months from the lowest to highest in terms of peak demand. The capacity used in the lowest demand month is obviously utilized in all other months as well. The additional capacity used in the next lowest demand month is utilized in all higher demand months, but not in the lowest demand month. Applying this same principle to each succeeding month results in a determination of the relative amount of capacity being utilized in each month.

Q. Is capacity utilization equivalent to total gas usage by the classes?

A. No, it is not. A class with more efficient utilization of capacity requires less capacity to provide the same total gas usage than one that utilizes the capacity in a less efficient manner. Consider a simple example of two classes having the same total usage of 100 MCFs per year. The class having perfect efficiency of capacity utilization takes 50 MCFs in both the off-peak and on-peak periods. The class having less efficient use of capacity takes 30 MCFs in the off-peak period and 70 MCFs in the on-peak period. Notice that the capacity required in the off-peak period is 80 (50 + 30) MCFs and the capacity required in the on-peak period is 120 (50 + 70) MCFs. Out of a total capacity of 120 MCFs, 80 MCFs of capacity is utilized in both periods, but an additional 40 (120 - 80) MCFs is needed to serve the on-peak period. If both classes had perfect efficiency (50 MCFs each in both periods) then the total capacity required would have only been 100 (50 + 50) MCFs. Clearly, the less efficient use of capacity by the one class has resulted in additional capacity being added to the system.

Q. Can you continue with your example to explain how capacity utilization is determined for each class?

A. Yes. The 80 MCFs of capacity required to meet the off-peak demand is also used to meet a portion of the on-peak demand. Assuming equal period lengths, half of this 80 MCFs of capacity is allocated equally to both periods (i.e., 40 MCFs off peak and 40 MCFs on-peak). The additional 40 MCFs of capacity required to serve the on-peak period is assigned to only that period. The result is, that of the 120 MCFs of total capacity, 40 MCFs goes to the off-peak period and 80 MCFs goes to the on-peak period.

The classes are then allocated the capacities from each period based on their contribution to demand (usage) as shown in the following table.

| | Class 1 | | Class 2 | | Total | |
|---|---|---|---|---|---|---|
| | Usage | Capacity | Usage | Capacity | Usage | Capacity |
| Off-Peak | 50 | 25 | 30 | 15 | 80 | 40 |
| On-Peak | 50 | 33.33 | 70 | 46.67 | 120 | 80 |
| Total | 100 | 58.33 | 100 | 61.67 | 200 | 120 |

While the total usage for each class is the same (100 MCFs each), the capacity utilized by the more efficient class 1 (58.33 MCFs) is less than the capacity utilized by the less efficient class 2 (61.67 MCFs).

## ALLOCATION OF SERVICE LINES

Q. How were the costs associated with service lines allocated?

A. Services were allocated by using the allocation factors developed by the Company after I reviewed the Company's analysis. Based on my review of the Company's analysis, I recommend that the Company's allocators for service lines be used.

## ALLOCATION OF METERS AND REGULATORS

Q. How were the costs associated with meters and regulators allocated?

A. Meters and regulators were allocated by using the allocators developed by the Company in this case. The Company's analysis was reviewed. Based on that review, I determined that the Company's allocators for meters and regulators produced reasonable allocations to the Classes.

## CALCULATION OF PEAK DEMANDS

Q. How were peak demands calculated?

A. To develop various allocators for use in Staff's Class Cost-of-Service Study, monthly peak demands were required. For the Residential and General Service Classes, Staff developed monthly peak Heating Degrees (HDD) by averaging the coldest day of the month for each of the 30 years in the historical data base. These monthly peak HDDs were then combined with the per customer usage coefficients that were determined by the Staff's weather normalization process to determine peak customer usage for the classes.

For the Interruptible Service and Transportation Service Classed, I used the monthly volumes developed by Staff witness Anne Ross to develop peaks. The Staff did not weather normalize these classes and therefore a peak day monthly demand was estimated by taking into account the fact that there are approximately 22 working days in a month so the monthly usage was divided by 22 for each month.

Q. Does this conclude your direct testimony?

A. Yes, it does.