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Missouri Public Service Commission

Exhibit No.:	
Issue:	Class Cost-of-Service Allocators
Witness:	Daniel I. Beck
Sponsoring Party:	MO PSC Staff
Type of Exhibit:	Direct Testimony
Case No.:	GR-2000-512

MISSOURI PUBLIC SERVICE COMMISSION

UTILITY OPERATIONS DIVISION

DIRECT TESTIMONY

OF

DANIEL I. BECK

UNION ELECTRIC COMPANY d/b/a AMERENUE

CASE NO. GR-2000-512

Jefferson City, Missouri
August 2000

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DANIEL I. BECK

UNION ELECTRIC COMPANY d/b/a AMERENUE

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DIRECT TESTIMONY

OF

DANIEL I. BECK

UNION ELECTRIC COMPANY d/b/a AMERENUE

CASE NO. GR-2000-512

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. Are you the same Daniel I. Beck that previously filed Direct Testimony regarding large customer annualization and peak demands in this case?

A. Yes.

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 tariff issues proposed by the Company in this case.

ALLOCATION OF MAINS

Q. What allocation factor was used for mains?

A. The cost of mains was allocated to the classes based on their utilization of the capacity of the system. The resulting allocators and the specific calculations are shown in Schedule 1.

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 SERVICES

Q. How did you treat the cost of services for purposes of allocating those costs to customer classes?

A. The treatment of the cost of services for purposes of allocations involved four steps. First, the relationship of services costs to length and peak day volumes was estimated using property records provided by the Company in Case No. GR-97-393 to determine the trended costs. Second, the trended costs for the Interruptible and Transportation classes was directly estimated. Third, the remaining costs were separated into two components: a customer component and a demand component. Fourth, allocation factors for each customer class were developed based on the percentage of total cost attributed to each class' customer and demand components. The resulting allocation factors are presented on Schedule 2.

Q. What are the customer and demand components for services?

A. Obviously, by definition, each service serves only one customer. For this reason, services are traditionally considered to be customer related costs. However, since the value of the service line to the customer is based on the needs (demands) of that specific customer, a demand component should be determined for each service. In practice, the customer component is determined and the remaining costs (the difference between the total services costs and the customer component) is the demand component.

Q. Would you please explain how the customer component of cost is calculated for each rate class?

A. The customer component is calculated by solving the trended cost function for services with a diameter of zero, commonly referred to as the intercept. The cost per unit length, which was calculated to be $4.29 per foot, multiplied by a typical length of service for each customer in each class times the number of customers in the class is the class' total customer component. Each class' total customer component was divided by these costs summed over all classes to determine the percentage of the customer component allocated to each rate class.

Q. How was the intercept determined for services?

A. Trended costs per unit length were plotted against service diameter, and analyzed by means of a log linear regression.

Q. From these costs, how were the total customer components for each class determined?

A. The zero diameter or intercept costs per length is multiplied by the total length of services serving each class to calculate the total customer components.

Q. How was the length of service for each class calculated?

A. In Case No. GR-96-193, Laclede Gas Company conducted a random sample of its customers to determine the typical service length for various cost-of-service classes. I used the results of this study to estimate the typical service length for Union Electric's service territory. Although these two gas companies do not serve the same customers, the application of this study to Union Electric's service territory resulted in an estimate that was within 1% of the total length of services from the property records in Case No. GR-97-393. For this reason, Staff used the Laclede Gas study to estimate service length for the classes.

Q. How are the demand components of services allocated to each rate class?

A. Because the services are sized to meet the non-coincident peak demand of each customer, the demand component is allocated to all rate classes in direct proportion to each class' non-coincident peak demand.

Q. How did you obtain the non-coincident peak demand data?

A. Non-coincident peak demands were obtained from Staff calculations of peak day demands per customer and average number of customers.

Q. Why were the Interruptible and Transportation classes directly assigned trended service costs?

A. These customers are the largest customers being served by the system and were therefore assigned the largest services to these classes.

ALLOCATION OF METERS

Q. How were the costs associated with meters allocated?

A. Meters were allocated by determining the direct, customer and demand components in a method similar to the calculation of services. Since this method is previously described in my testimony regarding services, I will not explain the rationale for the methodology. The resulting direct component, customer component, demand component, and combined allocators are shown in Schedule 3.

For meters, the direct assignment to the Interruptible and Transportation Classes was performed using a method that was similar to the adjustment made for services.

ALLOCATION OF REGULATORS

Q. How were the costs associated with regulators allocated?

A. Regulators were allocated by determining the customer and demand components using a method similar to the calculation of services. However, for regulators, the direct assignment to the Interruptible and Transportation Classes was not performed since a clear one to one correspondence could not be established. Since the method for calculating the customer and demand components is previously described in my testimony regarding services, I will not explain the rationale for the methodology. The resulting customer component, demand component, and combined allocators are shown in Schedule 4.

TARIFF ISSUES

Q. Please describe the Company's proposed tariff changes.

A. Most of the tariff changes are proposed by the Company to collect the requested revenue increase. In addition, the tariff changes on tariff sheet nos. 29.7, 29.9, 29.10, 29.11, 29.12, 29.13 and 29.14 are proposed by the Company to implement the Gas Supply Incentive Plan (GSIP).

Staff supports the revisions on Sheet No. 8 which makes a minor correction to the interruptible tariff language and the proposed EGM billing charge of $40.00. Staff also supports the proposed $21.00 electronic gas meter charge.

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 Union Electric Company d/b/a AmerenUE for Authority to File Tariffs Increasing Rates for Gas Service Provided to Customers in the Company's Missouri Service Area	))))	Case No. GR-2000-512

AFFIDAVIT OF DANIEL I. BECK

STATE OF MISSOURI)
) ss.
COUNTY OF COLE)

Daniel I. Beck, is 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 7 pages 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.

Daniel I Beck

DANIEL I. BECK

Subscribed and sworn to before me this 11th day of August 2000.

Joyce C. Neuner

Notary Public

Joyce C. Neuner
Notary Public, State of Missouri
County of Osage
My Commission Exp. 06/18/2001

My Commission Expires: My Commission Exp. 06/18/2001

Union Electric Company - Case No. GR- 2000-512
Mains Allocator

Monthly Class Peak Day Loads

	RES	SGS	INT	TRANS	System
Jul '98	43,874	35,297	17,969	113,522	210,662
Aug	50,932	38,972	24,656	110,134	224,694
Sep	177,509	104,295	19,605	117,897	419,306
Oct	328,846	182,307	21,527	118,859	651,539
Nov	507,683	274,524	26,609	136,471	945,287
Dec '98	722,686	385,541	28,966	159,248	1,296,441
Jan '99	818,274	434,773	28,351	168,594	1,449,992
Feb	748,317	398,697	26,998	195,566	1,369,578
Mar	533,141	287,706	26,621	158,296	1,005,764
Apr	362,267	199,571	23,884	173,928	759,650
May	209,249	120,684	17,461	135,114	482,508
Jun '99	79,151	53,629	23,826	119,178	275,784

Ranked Monthly Class Peak Day Loads
(Ranked by System Peak Day Loads)

RES	SGS	INT	TRANS	System	Increment	Multiplier	Monthly Increment	Monthly Cumulative Increment	RES	SGS	INT	TRANS
43,874	35,297	17,969	113,522	210,662	210,662	12	17,555	17,555	3,656	2,941	1,497	9,460
50,932	38,972	24,656	110,134	224,694	14,032	11	1,276	18,831	4,268	3,266	2,066	9,230
79,151	53,629	23,826	119,178	275,784	51,090	10	5,109	23,940	6,871	4,655	2,068	10,345
177,509	104,295	19,605	117,897	419,306	143,522	9	15,947	39,887	16,886	9,921	1,865	11,215
209,249	120,684	17,461	135,114	482,508	63,202	8	7,900	47,787	20,724	11,952	1,729	13,382
328,846	182,307	21,527	118,859	651,539	169,031	7	24,147	71,934	36,307	20,128	2,377	13,123
362,267	199,571	23,884	173,928	759,650	108,111	6	18,019	89,953	42,897	23,632	2,828	20,595
507,683	274,524	26,609	136,471	945,287	185,637	5	37,127	127,080	68,251	36,906	3,577	18,347
533,141	287,706	26,621	158,296	1,005,764	60,477	4	15,119	142,199	75,378	40,677	3,764	22,381
722,686	385,541	28,966	159,248	1,296,441	290,677	3	96,892	239,092	133,279	71,102	5,342	29,369
748,317	398,697	26,998	195,566	1,369,578	73,137	2	36,569	275,660	150,617	80,247	5,434	39,362
818,274	434,773	28,351	168,594	1,449,992	80,414	1	80,414	356,074	200,943	106,767	6,962	41,402
								1,449,992	760,076	412,196	39,510	238,210
									52.42%	**28.43%**	**2.72%**	**16.43%**

Schedule 1

Union Electric Company - Case No. GR- 2000-512
Service Allocator

Cost of Service Classes	Service Length	Number of Customers	Direct Assigned Service Length	Direct Assigned Service Cost	Assigned Portion	Total Service Length	Intercept Cost	Customer Portion	Peak Day Demands	Demand Portion	Services Allocator
Residential	64.64	97,143				6,279,324		37.60%	818,274	37.23%	74.83%
Small General Service	113.81	11,960				1,361,168		4.63%	434,773	19.78%	24.41%
Interruptible	197.13	19	3,745	$108,502	0.14%						0.14%
Transportation	197.13	84	16,559	$479,694	0.62%						0.62%
		109,206	20,304	$479,694	0.76%	7,640,491	$32,777,707	42.22%	1,253,047	57.02%	100.00%

Customer Portion = $32,777,707 / $77,626,622 = 42.22%

Union Electric Company - Case No. GR- 2000-512
Meter Allocator

Cost of Service Classes	Direct Meter Costs	Assigned Portion	Number of Customers	Intercept Cost	Customer Portion	Peak Day Demands	Demand Portion	Meters Allocator
Residential			97,143		20.83%	818,274	48.63%	69.464%
Small General Service			11,960		2.56%	434,773	25.84%	28.405%
Interruptible	$45,623	0.35%						0.346%
Transportation	$235,111	1.78%						1.785%
	$235,111	2.13%	109,103	$3,082,160	23.40%	1,253,047	74.47%	100.000%

Customer Portion = $3,082,160 / $13,174,377 = 23.40%

Union Electric Company - Case No. GR- 2000-512
Regulator Allocator

Cost of Service Classes	Number of Customers	Intercept Cost	Customer Portion	Peak Day Demands	Demand Portion	Regulators Allocator
Residential	97,143		74.33%	818,274	9.11%	83.434%
Small General Service	11,960		9.15%	434,773	4.84%	13.989%
Interruptible	19		0.01%	28,966	0.32%	0.337%
Transportation	84		0.06%	195,566	2.18%	2.240%
	109,206	$5,678,712	83.56%	1,477,579	16.44%	100.000%

Customer Portion = $5,678,712 / $6,796,108 = 83.56%