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**Missouri Public
Service Commission**

Exhibit No.:

Issue:

**Weather Normalized Sales;
Billing Units**

Witness:

Henry E. Warren

Sponsoring Party:

MoPSC Staff

Type of Exhibit:

Direct Testimony

Case No.:

GR-2000-512

MISSOURI PUBLIC SERVICE COMMISSION

UTILITY OPERATIONS DIVISION

DIRECT TESTIMONY

OF

HENRY E. WARREN, PhD

UNION ELECTRIC COMPANY

d/b/a AmerenUE

CASE NO. GR-2000-512

**Jefferson City, Missouri
August 2000**

DIRECT TESTIMONY

OF

HENRY E. WARREN

UNION ELECTRIC COMPANY

d/b/a AmerenUE

CASE NO. GR-2000-512

Q. Please state your name and business address.

A. My name is Henry E. Warren and my business address is 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 (PSC or Commission) as a Regulatory Economist in the Gas Department of the Utility Operations Division.

Q. How long have you been employed by the Commission?

A. I have worked at the Commission approximately eight years.

Q. What is your educational and professional background?

A. I received my Bachelor of Arts and my Master of Arts in Economics from the University of Missouri-Columbia, and a Doctor of Philosophy (PhD) in Economics from Texas A&M University. Prior to joining the PSC Staff (Staff), I was an Economist with the U.S. National Oceanic and Atmospheric Administration (NOAA).

At NOAA I conducted research on the economic impact of climate and weather. I began my employment at the Commission on October 1, 1992, as a Research

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1 Economist in the Economic Analysis Department. My duties consisted of calculating
2 adjustments to test year usage by gas and electric customers in rate cases to compensate
3 for variations from normal weather, and I also assisted in the review of Electric Resource
4 Plans for investor owned utilities in Missouri. Since December 1, 1997, I have been a
5 Regulatory Economist II in the Tariffs/Rate Design Section of the Commission's Gas
6 Department where my duties include reviewing tariff filings, applications and various
7 other matters relating to regulated gas utilities in Missouri. I also compute weather
8 normalization adjustments to test year volumes in gas rate cases.

9 Q. Are you a member of any professional organizations?

10 A. Yes, I am a member of the International Association for Energy
11 Economics and the Western Economics Association.

12 Q. Have you previously filed testimony before the Commission?

13 A. Yes, I have submitted prepared written testimony in the cases listed in
14 Schedule 1 attached to this testimony.

15 Q. What is the purpose of your direct testimony?

16 A. My direct testimony covers the billing unit allocation for volumes
17 normalized for weather annual read cycle days computed by Staff Witness James Gray in
18 the test year for AmerenUE's General Service (GS) rate class. The initial inputs,
19 computed adjustments and the final results of this allocation of normal volumes are
20 shown in Schedules 2-1 through 2-3.

GENERAL SERVICE BILLING DETERMINANTS

Q. What are the billing determinants which were established for the GS class by the current rate design and how are Mr. Gray's normalized volumes allocated according to these billing determinants?

A. AmerenUE's current GS rates are differentiated into two blocks. For a GS customer the *first block* contains the first 7,000 Ccf used in the month and the *second block* contains all volumes over 7,000 Ccf per month. In order for Staff witness Mr. John Cassidy to compute the revenues associated with the normal volumes, the normal volumes must be properly allocated monthly to each block to determine the rate at which the volumes are to be billed.

Q. What data are used to compute these billing determinants?

A. The Company provided Staff with bill frequency runs for rate codes and customer classes served on the GS tariff. I used the Company's bill frequency runs (July 1995-June 1996) to determine the percentage of usage falling into each rate block for each month. Because the rates are the same for the three parts of their service area -- Panhandle Eastern, Natural Gas Pipeline, and Texas Eastern, the monthly data were aggregated over the service area for the GS rate codes -- Small General Service and Large General Service.

Q. How did you use that data to determine normalized billing determinants for the test year?

A. For the GS class, using the monthly bill frequency data for 1995-96, the monthly percent of use in the initial block has a high correlation with the monthly average use per customer per day. I used regressions to estimate an equation that

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1 quantified the relationship between the percentage of use in the first block in a month and
2 the average use per customer per month. I used this relationship in order to estimate
3 actual and normal billing units in each month. The actual monthly usage in the test year
4 (1998-99) is used to estimate the monthly percent use in the first block (Schedule 2-1).
5 Next, the normal monthly usage per customer was used in the regression equation to
6 estimate the normal monthly percent use in the first block (Schedule 2-2).

7 For the estimated test year and estimated normal, the adjustment in the
8 second block is set equal to the total minus initial block adjustment. In each month the
9 block adjustments are restricted so the blocks cannot go in a different direction than the
10 total adjustment. If the block adjustments initially have opposite signs, the adjustment of
11 the volumes in the first block is set to zero. The second block is then equal to the total
12 adjustment.

13 The difference between the predicted normal volumes and predicted test
14 year volumes gives an estimated monthly adjustment for the first block (Schedule 2-3).
15 The monthly adjustments to Test Year volumes in the blocks are in the center column of
16 the Tables in Schedule 2-3. The monthly adjustments are summed into annual totals.
17 The normal annual volumes in the second block are 10% of the total annual volumes
18 (Schedule 2-2).

19 Q. What is the Staff's recommendation for weather adjusted gas usage for the
20 GS residential, commercial, and industrial customer classes?

21 A. Schedule 2-3 contains the adjustment volumes for each billing month
22 during the test year. The total adjustment for the GS customer classes is 3,895,299 Ccf.
23 These volumes were allocated to the blocks for the GS class as shown in Schedule 2-3.

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1 These adjustments were supplied to Staff witness Mr. John Cassidy for use in revenue
2 normalization.

3 Q. Does this conclude your prepared Direct Testimony?

4 A. Yes, it does.

UNION ELECTRIC COMPANY

d/b/a AMERENUE

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PREVIOUS CASES IN WHICH PREPARED TESTIMONY WAS PRESENTED BY:

HENRY E. WARREN

<u>COMPANY NAME</u>	<u>CASE NUMBER</u>
St. Joseph Light and Power Company	GR-93-042 ¹
Laclede Gas Co.	GR-93-149 ¹
Missouri Public Service	GR-93-172 ¹
Western Resources	GR-93-240 ¹
Laclede Gas Co.	GR-94-220 ¹
United Cities Gas Co.	GR-95-160 ¹
The Empire District Electric Co.	ER-95-279 ¹
Laclede Gas Co.	GR-96-193 ¹
Missouri Gas Energy	GR-96-285 ¹
The Empire District Electric Co.	ER-97-081
Union Electric Co.	GR-97-393 ¹
Missouri Gas Energy	GR-98-140 ¹
Laclede Gas Co.	GR-98-374
St. Joseph Light & Power Company	GR-99-246 ¹
Laclede Gas Co.	GR-99-315 ¹

¹ Testimony includes computations to adjust test year volumes, therms, or kWh to normal weather.

Union Electric Company
d/b/a AmerenUE
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General Service Class -- Billing Units by Rate Block

TABLE 1
Test Year Billing Units Allocated to Rate Blocks
JULY 1998 - JUNE 1999

General Service Class (SGS and LGS)						
Month	Bills	Estimated Ccf By Category				Total Ccf
		Usage<7,000	1st Block %	7,000<Usage	2nd Block %	
Jul 98	11,551	1,036,865	87%	151,955	13%	1,188,820
Aug	11,428	1,041,819	87%	150,267	13%	1,192,086
Sep	11,428	1,111,237	88%	151,362	12%	1,262,599
Oct	11,464	1,257,245	90%	138,119	10%	1,395,364
Nov	11,605	2,326,819	93%	172,798	7%	2,499,617
Dec	11,704	3,541,127	92%	311,735	8%	3,852,862
Jan 99	11,782	7,870,326	88%	1,084,474	12%	8,954,800
Feb	11,802	5,824,108	90%	613,965	10%	6,438,073
Mar	11,792	5,245,524	91%	542,253	9%	5,787,777
Apr	11,768	3,517,468	93%	277,484	7%	3,794,952
May	11,726	1,842,829	91%	173,429	9%	2,016,258
Jun	11,658	1,214,738	87%	176,784	13%	1,391,522
Annual	139,708	35,830,105	90%	3,944,624	10%	39,774,730

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General Service Class -- Billing Units by Rate Block

TABLE 2
Normal Billing Units Allocated to Rate Blocks
JULY 1998 - JUNE 1999

General Service Class (SGS and LGS)						
Month	Bills	Estimated Ccf By Category				Total Ccf
		Usage<7,000	1st Block %	7,000<Usage	2nd Block %	
Jul	11,551	1,009,360	87%	147,925	13%	1,157,285
Aug	11,428	1,041,819	87%	150,267	13%	1,192,086
Sep	11,428	1,149,755	88%	156,609	12%	1,306,363
Oct	11,464	1,422,769	90%	156,303	10%	1,579,072
Nov	11,605	2,536,168	93%	188,535	7%	2,724,703
Dec	11,704	4,818,221	91%	484,008	9%	5,302,229
Jan	11,782	7,497,742	88%	1,037,980	12%	8,535,722
Feb	11,802	7,201,424	89%	922,002	11%	8,123,426
Mar	11,792	5,492,004	90%	633,196	10%	6,125,200
Apr	11,768	3,709,363	92%	316,650	8%	4,026,013
May	11,726	1,925,672	91%	187,266	9%	2,112,937
Jun	11,658	1,296,333	87%	188,658	13%	1,484,992
Annual	139,708	39,100,629	90%	4,569,399	10%	43,670,028

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General Service Class -- Billing Units by Rate Block

TABLE 3
Adjustments to Billing Units Allocated to Rate Blocks
JULY 1998 - JUNE 1999

General Service Class (SGS and LGS)						
Month	Bills	Estimated Ccf By Category				Total Ccf
		Usage<7,000	1st Block %	7,000<Usage	2nd Block %	
Jul	0	-27,504	87%	-4,031	13%	-31,535
Aug	0	0	0%	0	0%	0
Sep	0	38,518	88%	5,246	12%	43,764
Oct	0	165,524	90%	18,184	10%	183,708
Nov	0	209,349	93%	15,737	7%	225,086
Dec	0	1,277,094	88%	172,273	12%	1,449,367
Jan	0	-372,584	89%	-46,494	11%	-419,078
Feb	0	1,377,316	82%	308,037	18%	1,685,353
Mar	0	246,481	73%	90,943	27%	337,424
Apr	0	191,895	83%	39,166	17%	231,061
May	0	82,842	86%	13,837	14%	96,679
Jun	0	1,296,333	99%	11,875	1%	1,308,208
Annual	0	4,485,262	88%	624,775	12%	5,110,037