

Exhibit No.:
Issue: Revenue Normalization
Witness: Henry E. Warren
Type of Exhibit: Direct
Sponsoring Party: MoPSC Staff
Case No.: ER-97-81

MISSOURI PUBLIC SERVICE COMMISSION
POLICY & PLANNING DIVISION

DIRECT TESTIMONY
OF
HENRY E. WARREN

THE EMPIRE DISTRICT ELECTRIC COMPANY

CASE NO. ER-97-81

FILED
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MISSOURI
PUBLIC SERVICE COMMISSION

Jefferson City, Missouri

February, 1997

**DIRECT TESTIMONY
OF
HENRY E. WARREN
THE EMPIRE DISTRICT ELECTRIC COMPANY
ER-97-81**

Q. Please state your name and business address.

A. My name is Henry E. Warren and my business address is Missouri Public Service Commission, P. O. Box 360, Jefferson City, Missouri 65102.

Q. Please state your educational and professional background.

A. I received a Bachelor of Arts and a Master of Arts in Economics from the University of Missouri-Columbia, and a PhD in Economics from Texas A&M University. Previously, I was an Economist with the U.S. National Oceanic and Atmospheric Administration. My tenure at the Missouri Public Service Commission began in October 1, 1992. My current position is Regulatory Economist II.

Q. Have you previously filed testimony before the Missouri Public Service Commission (Commission)?

A. Yes, I filed testimony in case nos. GR-93-42, the gas rate case of St. Joseph Light and Power; GR-93-172, the gas rate case of Missouri Public Service, a division of Utilicorp United, Inc.; the Western Resources case no. GR-93-240; the Laclede Gas Co. case nos. GR-94-150, GR-94-220 and GR-96-193; the United Cities Gas Co. case no. GR-95-160; the Missouri Gas Energy case no. GR-96-285; and The Empire District Electric Company case no. ER-95-279.

Q. What do you address in your direct testimony?

A. I present the results of the calculations allocating the normalization adjustment to sales by rate block for the Residential (Res), General Service (GS), and General Power (GP) for Empire District Electric Company (EDE or Company). The normalization adjustments to sales for the test year were provided by Staff Witnesses Lena Mantle and Ken Christie. The allocation of the normalization adjustment to the test year is based on the results of the relationship between average

Direct Testimony of
Henry E. Warren

1 monthly use per customer (kWh/customer) and the percent of kWh in the rate blocks using regression
2 analysis. Changes in the percent of kWh in the rate blocks were calculated from the changes in the
3 average monthly use per customer associated with the normalization adjustment. Finally, revenue
4 adjustments were computed by multiplying the appropriate seasonal rates by the normalization
5 adjusted sales in each rate block. The computed adjustments to test year kWh and revenues for Res,
6 GS, and GP classes are in Schedules 1-1, 1-2, and 1-3 respectively for the EDE Missouri service area.

7 Q. What is the basis for determining the allocation of monthly kWh to the rate blocks in
8 the test year?

9 A. In response to a data request I sent to the Company, the Company sent Staff bill
10 frequency data for rate codes and customer classes served on the Res, GS, and GP rates. I used the
11 Company's bill frequency data to calculate the aggregate kWh billed at each rate block for each month
12 of the test year.

13 Q. What is the relationship between monthly usage in a rate block and average monthly
14 usage?

15 A. The Company's bill frequency data was used to calculate the percent of aggregate
16 billed kWh/month in the first block each month for each of seven customer classes. The statistical
17 relationship between this monthly percentage of kWh billed in the first block and monthly total
18 kWh/customer was quantified using regression analysis for each of the seven classes. This fits a line
19 to the paired monthly quantities, kWh/customer and the percent of total kWh billed in the first block
20 by estimating intercept and slope coefficients. The estimated relationship for Res General is in
21 Schedule 2. This relationship was estimated for the first block for rate codes with two blocks and
22 for blocks one and two for rate codes GS TEB and GP Sec with three blocks.

23 Using the estimated slope coefficient, the percentage of use in the first block in a month can
24 be estimated from the normalized monthly kWh/customer. This relationship was used to calculate
25 the percentage of normal kWh in the first block in each month. The difference between the predicted

Direct Testimony of
Henry E. Warren

1 normal sales and predicted actual sales gives an estimated adjustment to the first block for each
2 month. The adjustment in the last block is equal to the total adjustment minus the first block
3 adjustment or first and second block adjustment.

4 In each month the adjustment in the block is restricted so the individual blocks cannot go in
5 a different direction than the total adjustment. If the first and second block adjustments initially have
6 opposite signs, the adjustment to the sales in the first block is set to zero. Then the adjustment in the
7 last block is the total adjustment. The monthly adjustments to test year kWh in the blocks are in the
8 tables, *Normalization Adjustments to Sales and Revenues* in Schedules 1-1, 1-2, and 1-3. The
9 monthly adjustments are summed into an annual total and seasonal totals. The seasonal totals are for
10 winter (October 16-- June 15) and summer (June 16 -- October 15). The monthly adjustments for
11 each customer class were provided to Staff Witness Janice Pyatte.

12 Q. What special considerations were taken into account in this allocation process?

13 A. First, because the seasonal rate division is in the middle of June and October, the
14 customers in bill cycles ending before the fifteenth of those months had to be separated from those
15 ending after the fifteenth. Second, because municipal customers received discounts, the revenue
16 adjustment within each rate class had to be proportionately allocated between non-municipal and
17 municipal usage. Third, for purposes of pricing, the difference between calendar year and billing year
18 normalized sales were assigned equally to the first and last months of the test year.

19 Q. Does this complete your direct testimony?

20 A. Yes, it does
21
22
23

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) CASE NO. ER-97-81
Increasing Rates for Electric Service Provided to)
Customers in the Missouri Service Area of the Company.)

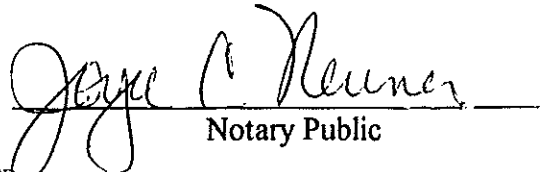
AFFIDAVIT OF HENRY E. WARREN

STATE OF MISSOURI)
) ss
COUNTY OF COLE)

Henry E. Warren, 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 3 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.


Henry E. Warren

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


Notary Public

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

**EMPIRE DISTRICT ELECTRIC ER-97-81
RESIDENTIAL CLASSES
NORMALIZATION ADJUSTMENTS TO SALES AND REVENUES**

TEST YEAR OCTOBER 1995 - SEPTEMBER 1996

Test Year Month	Group 1 Rate 41 Residential General		Group 2 Rate 43 Residential Water Heat		Group 3 Rate 45 Residential Space Heat		Residential Gen, WH, and SH Total	
	Sales Adj. kWh	Revenue Adj. \$	Sales kWh	Revenue \$	Sales kWh	Revenue \$	Sales kWh	Revenue \$
OCT	2,488,492	\$140,218	257,510	\$14,157	931,238	\$51,372	3,677,239	\$205,748
NOV	179,280	\$7,235	95,681	\$3,617	382,425	\$15,517	657,386	\$26,368
DEC	(894,184)	(\$34,905)	(665,423)	(\$24,133)	(2,999,656)	(\$106,675)	(4,559,263)	(\$165,713)
JAN	(611,076)	(\$24,025)	(439,147)	(\$16,077)	(1,966,580)	(\$70,041)	(3,016,803)	(\$110,143)
FEB	(158,713)	(\$6,208)	(353,952)	(\$12,916)	(1,298,413)	(\$46,253)	(1,811,078)	(\$65,376)
MAR	(193,996)	(\$7,580)	(331,395)	(\$12,007)	(583,550)	(\$20,588)	(1,108,941)	(\$40,175)
APR	(1,959,125)	(\$76,705)	(1,533,372)	(\$55,883)	(7,763,846)	(\$278,886)	(11,256,343)	(\$411,474)
MAY	(1,468,331)	(\$58,072)	(693,317)	(\$26,141)	(2,355,924)	(\$91,779)	(4,517,572)	(\$175,993)
JUN	(4,974,777)	(\$210,956)	(1,233,568)	(\$51,691)	(2,315,742)	(\$100,874)	(8,524,087)	(\$363,521)
JUL	4,398,741	\$261,227	1,021,194	\$60,659	2,210,707	\$131,316	7,630,642	\$453,202
AUG	13,542,681	\$804,259	3,290,575	\$195,460	6,149,599	\$365,286	22,982,855	\$1,365,006
SEP	12,487,490	\$741,544	3,439,347	\$204,297	6,077,442	\$361,000	22,004,278	\$1,306,841
Total	22,836,481	\$1,536,033	2,854,133	\$279,342	(3,532,301)	\$209,395	22,158,313	\$2,024,770

**EMPIRE DISTRICT ELECTRIC ER-97-81
GENERAL SERVICE CLASSES
NORMALIZATION ADJUSTMENTS TO SALES AND REVENUES**

TEST YEAR OCTOBER 1995 - SEPTEMBER 1996

	Group 4 Rate 25 General Service -- CB		Group 5 Rate 26 General Service -- SH		Group 6 Rate 63 General Service -- TEB		General Service CB, SH, and TEB Total	
Test Year Month	Sales kWh	Revenue \$	Sales kWh	Revenue \$	Sales kWh	Revenue \$	Sales kWh	Revenue \$
OCT	788,426	\$51,071	419,637	\$26,036	1,421,167	\$60,391	2,629,229	\$137,497
NOV	80,330	\$3,934	38,066	\$1,435	115,504	\$3,423	233,900	\$8,791
DEC	(389,635)	(\$19,056)	(289,656)	(\$10,717)	(587,484)	(\$17,528)	(1,266,775)	(\$47,301)
JAN	(318,724)	(\$15,277)	(232,903)	(\$8,238)	(411,198)	(\$12,392)	(962,825)	(\$35,907)
FEB	(115,408)	(\$5,569)	(125,816)	(\$4,445)	(261,607)	(\$7,842)	(502,831)	(\$17,855)
MAR	(282,787)	(\$13,821)	(87,838)	(\$3,243)	(462,596)	(\$13,908)	(833,221)	(\$30,972)
APR	(1,000,498)	(\$48,849)	(759,206)	(\$28,110)	(1,708,170)	(\$50,810)	(3,467,874)	(\$127,768)
MAY	(349,161)	(\$17,146)	(183,177)	(\$7,001)	(609,618)	(\$18,114)	(1,141,956)	(\$42,261)
JUN	(776,654)	(\$38,178)	(336,077)	(\$13,236)	(753,040)	(\$24,014)	(1,865,771)	(\$75,427)
JUL	1,007,535	\$67,875	314,454	\$21,358	401,846	\$18,927	1,723,835	\$108,160
AUG	2,239,106	\$150,879	722,455	\$49,071	1,128,095	\$52,936	4,089,656	\$252,886
SEP	2,456,792	\$165,410	897,037	\$60,922	2,377,797	\$111,084	5,731,627	\$337,417
Total	3,339,322	\$281,274	376,976	\$83,832	650,695	\$102,153	4,366,993	\$467,259

**EMPIRE DISTRICT ELECTRIC ER-97-81
GENERAL POWER CLASSES
NORMALIZATION ADJUSTMENTS TO SALES AND REVENUES**

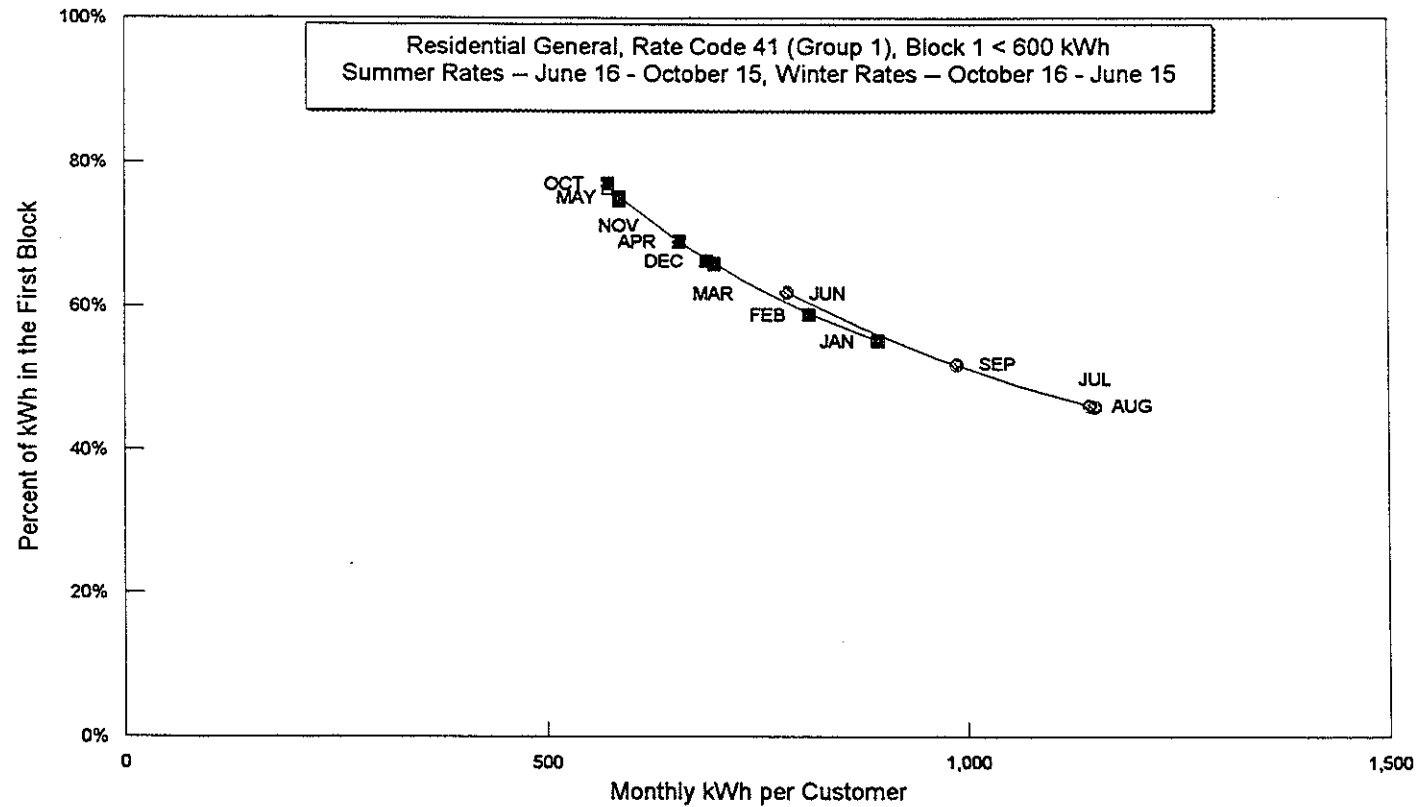
TEST YEAR OCTOBER 1995 - SEPTEMBER 1996

Test Year Month	Group 7 Rate 68 General Power -- Primary		Group 8 Rate 68 General Power -- Secondary		General Power Primary and Secondary Total	
	Sales	Revenue	Sales	Revenue	Sales	Revenue
	kWh	\$	kWh	\$	kWh	\$
OCT	43,168	\$1,269	1,279,928	\$40,293	1,323,096	\$41,562
NOV	0	\$0	(70,632)	(\$1,999)	(70,632)	(\$1,999)
DEC	0	\$0	(39,793)	(\$1,124)	(39,793)	(\$1,124)
JAN	0	\$0	(177,993)	(\$5,039)	(177,993)	(\$5,039)
FEB	0	\$0	(274,877)	(\$7,776)	(274,877)	(\$7,776)
MAR	0	\$0	(364,595)	(\$10,327)	(364,595)	(\$10,327)
APR	0	\$0	171,205	\$4,843	171,205	\$4,843
MAY	0	\$0	(197,727)	(\$5,580)	(197,727)	(\$5,580)
JUN	0	\$0	(720,563)	(\$20,488)	(720,563)	(\$20,488)
JUL	0	\$0	890,032	\$26,987	890,032	\$26,987
AUG	0	\$0	1,719,898	\$52,013	1,719,898	\$52,013
SEP	43,169	\$359	2,589,980	\$78,343	2,633,149	\$78,703
Total	86,337	\$1,628	4,804,863	\$150,147	4,891,200	\$151,775

EMPIRE DISTRICT ELECTRIC -- ER-97-81

Estimated Relationship Between kWh/Customer and %kWh in the First Block

Test Year -- October 1995 - September 1996



■ Observed Mo. Winter Block 1 %kWh ◇ Observed Mo. Summer Block 1 %kWh △ Est. Mo. Winter Block 1 %kWh
 ○ Est. Mo. Summer Block 1 %kWh — Est. Mo. Winter Block 1 %kWh vs kWh/C — Est Mo. Summer Block 1 %kWh vs kWh/C