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Witness: Dennis Patterson
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Case No.: EO-96-14

MISSOURI PUBLIC SERVICE COMMISSION

UTILITY OPERATIONS DIVISION

DIRECT TESTIMONY

OF

DENNIS PATTERSON

UNION ELECTRIC COMPANY

CASE NO. EO-96-14

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DIRECT TESTIMONY
OF
DENNIS PATTERSON
UNION ELECTRIC COMPANY
CASE NO. EO-96-14

Q. Please state your name and business address.

A. My name is Dennis Patterson 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 (Commission)?

A. I am a Regulatory Economist in the Electric Department of the Utility Operations Division.

Q. Please review your educational background and work experience.

A. I was trained as an officer and aviator in the U.S. Army. I studied economics, math, sciences and languages, receiving a B.A. in Latin American Studies (University of Missouri, 1983) and an M.S. in Agricultural Economics (University of Missouri, 1989). I joined the Staff of the Commission in April, 1986. I established the Staff's centralized weather data base, and have continued to maintain and improve it by employing data and methods from reliable sources. I have been employed by the Commission, the Missouri Army National Guard, the University of Missouri, the U.S. Army Reserves, and the U.S. Army.

PURPOSE

Q. What is the purpose of your testimony?

A. I will sponsor Staff's corrections to Union Electric Company's (Company's) proposed adjustments to sharing period sales for the difference between sharing period (actual) weather and historical average (normal) weather.

WHY CORRECTIONS ARE NECESSARY

Q. Why was it necessary to calculate corrections to the Company's adjustments?

A. In its review of the Company's adjustments, the Staff found two potential sources of error. These sources were the Company's actual calendar month weather and normal calendar month weather. The Staff found that both differed significantly from the Staff's actual and normal calendar month weather over each of the three years of Union Electric's first experimental alternative regulation plan, namely, the three years which ended on June 30 of 1996, 1997 and 1998, respectively.

Q. What was the cause of these differences in weather data?

A. There were two causes. The first cause lies in the differences in approaches used by the Company and the Staff to maintain a consistent time series of daily temperatures for the weather station at St. Louis Lambert International Airport (STL). The second cause lies in the selection of the years of temperature data to be used to calculate weather normals.

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1 Q. Why would the history of daily temperatures at STL be inconsistent?

2 A. The exposure parameters of the thermometer at a weather station
3 would include the following properties: the type of thermometer in use, the method of
4 calibration, the nature of the necessary shelter from direct sunlight, the exact geographic
5 location, the elevation of the thermometer above the ground, the nature of nearby terrain
6 features, and the time that daily observations are made. When any exposure parameter
7 varies, the weather station experiences an "exposure change". STL has had a number of
8 exposure changes over the years that cause temperature readings from one period to be
9 inconsistent with temperature readings from another. The most recent occurred in May
10 of 1996, when the modernized ASOS (Automated Surface Observing System) was
11 commissioned at STL in an open grassy area between runways 12L and 12R, near the
12 approach (northwest) end of these runways. Obsolete instruments had been located to
13 the north of runway 12L, among a growing collection of buildings that protected the
14 instruments from cold northwest winds. An adjacent asphalt parking lot was open to the
15 afternoon sun. Over a short transition period when both sets of instruments were
16 operating, it was not surprising to find that the former location tended to exhibit warmer
17 temperature readings than the new one.

18
19 **UNION ELECTRIC COMPANY'S APPROACH**
20 **TO EXPOSURE CHANGE ADJUSTMENTS**

21 Q. What is the Company's approach to adjusting STL temperatures for
22 exposure changes?

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1 A. The Company's approach was devised as a temporary measure during
2 the Union Electric Company's rate design case, Case No. EO-96-15. The STL exposure
3 change of May, 1996, occurred during the test year for that case. In order to address that
4 single exposure change, the Company calculated the difference between STL daily
5 temperatures and the average of temperatures from a group of nearby stations over the
6 three months before May 15, 1996, and compared that difference with its equivalent over
7 three months after that date. The Company used the results to calculate an adjustment of
8 +2.0 degrees Fahrenheit (F) to be applied to STL temperatures from May 16, 1996
9 through the end of the test year. For the purposes of that rate design case only, the Staff
10 did not object to the Company's normals period or exposure change adjustment method
11 because, in the Staff's opinion, no better alternative could be devised within the time
12 constraints originally envisioned for that case. In addition, there would be no revenue
13 impact upon the customers if the Company's method were used.

14 Q. Has the Company updated its exposure change analysis or weather
15 normals period since EO-96-15?

16 A. No, it has not. Based on the preliminary calculations, the Company
17 continues to add a constant adjustment of +2.0 degrees F to daily temperatures at STL in
18 the present case. The Company has not addressed any of the earlier exposure changes at
19 STL. Finally, the Company still proposes to use the period 1930 through the present
20 month to calculate weather normals from its adjusted temperature data base for STL.

21

22 **THE STAFF'S APPROACH TO EXPOSURE CHANGE ADJUSTMENTS**

23 Q. What is the Staff's approach to adjusting daily temperatures?

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Dennis Patterson

1 A. Since 1994, the Staff's approach to constructing a consistent time
2 series of daily temperatures has been to adjust historical temperatures to be consistent
3 with the current readings. This approach is taken under the logic that exposure changes
4 are the price of progress in measurement technology, and that the most recent
5 instrumentation is the most accurate. The Staff's approach is based on the methodology
6 that the National Oceanographic and Atmospheric Administration (NOAA) follows when
7 it constructs a time series of average temperatures for the calculation of normals. These
8 time series contain different exposure change adjustments for every period where a
9 significant change in location or type of measurement instrument has taken place. For
10 first-order weather stations such as STL, NOAA will have evaluated a number of
11 documented exposure changes in its calculation of adjustments to recorded temperatures
12 over the thirty years in the current NOAA normals period of 1961 through 1990.
13 Temperature exposure changes are evaluated by comparing temperatures before and after
14 the changes with temperatures at nearby stations where no such exposure change
15 occurred during the period under consideration. Since temperature differences between
16 weather stations vary by season, NOAA usually waits until at least a full year of
17 temperature observations are available after an exposure change occurs, before
18 calculating adjustments.
19

RATE CASE HISTORY OF EXPOSURE CHANGE ADJUSTMENTS

AT ST. LOUIS LAMBERT INTERNATIONAL AIRPORT

Q. Had the Staff reviewed STL exposure changes prior to the rate design case EO-96-15?

A. Yes, it had. While preparing new tariffs that were filed in December, 1995, the Laclede Gas Company (LGC) found that STL temperatures apparently contained a warming bias that had existed for several years. Prompted by LGC's concerns, the Staff conducted an analysis of STL temperatures with respect to temperatures at surrounding stations in the subsequent rate case, LGC rate case, Case No. GR-96-193. The analysis showed a significant upward shift in temperatures dating from an exposure change that occurred in the late 1980s.

Q. Had NOAA calculated an adjustment for this exposure change at STL?

A. No, it had not. Possibly because the change occurred only a year or two before the end of the current normals period in 1990, NOAA did not calculate adjustments for that exposure change when it prepared the sequential time series of monthly average temperatures upon which NOAA's STL 1961-1990 normals are based. Therefore, the Staff believed that the official STL weather data for the 1995 test year were not consistent with the 1961-1990 normals for STL, and could not be used for weather normalization in the GR-96-193 rate case.

Q. What did Staff propose for weather normalization in LGC's GR-96-193 rate case?

A. The Staff's proposed weather normalization for that case was based on the use of the St. Charles weather station (STCH).

Direct Testimony of
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1 Q. Why wasn't STCH used as the weather station in Union Electric
2 Company's rate design case, Case No. EO-96-15?

3 A. The Staff initially proposed the use of STCH as the weather station for
4 that case. Unfortunately, the Company's weather models could not be successfully "fit"
5 to STCH weather data. Although the STL exposure changes from before 1990 and from
6 1996 could not be resolved within the time constraints initially envisioned for Union
7 Electric's rate design case, the rate design analysis was to be "revenue neutral." In
8 addition, the Staff had no acceptable solution to offer. In order that the rate design case
9 might move forward, the Staff expressed its reservations about the Company's weather
10 data but agreed to use the Company's long normals period and preliminary exposure
11 change adjustments only for the purposes of the rate design case.

12

13 **RESOLUTION OF EXPOSURE CHANGE ADJUSTMENTS**

14 Q. Have the exposure change issues ever been resolved for STL?

15 A. Yes, they have. Sufficient temperature data had been accumulated at
16 the new STL weather station location when LGC filed its most recent rate case, GR-98-
17 374. For the purposes of that rate case as well as for future St. Louis area rate cases, the
18 Staff contracted with Steve Qi Hu, PhD., to calculate adjustments for exposure changes at
19 STL. Dr. Hu, who served as the Missouri State Climatologist at that time, sponsored the
20 Staff's weather data for the LGC rate case, Case No. GR-98-374.

21

22 **DIFFERENCES BETWEEN TEMPERATURE DATA SETS**

23 Q. What was the source of the Company's weather data set?

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1 A. The Company maintains its own history of STL daily temperature
2 observations, updated each day.

3 Q. What was the source of the Staff's weather data set?

4 A. Dr. Hu provided the Staff's weather data set.

5 Q. How did the Company's version of actual and normal STL weather
6 differ from the Staff's actual and normal weather from Dr. Hu's data set of STL daily
7 temperatures?

8 A. The Company's weather was based on the Company's data set of STL
9 daily temperatures dating from 1930. The Company's daily temperatures contained a
10 constant 2.0 degrees F correction for the installation of the new ASOS thermometer, for
11 all days after May 15, 1996. The Company made no corrections in its weather data base
12 for thermometer changes prior to that date. When calculating calendar month normals
13 from this data base, the company used daily data from that month over all the years,
14 beginning with 1930 and ending with the current year.

15 The Staff's actual and normal weather were based on Dr. Hu's daily mean
16 temperatures for STL, dating from January 1, 1961. Dr. Hu's STL daily temperatures
17 contained corrections for thermometer exposure changes that occurred in 1978, 1988 and
18 1996. The Staff's calculations of STL normals from Dr. Hu's data were based on
19 historical averages over the 1961-1990 time period. This method follows the
20 recommendations of Dr. Hu, and complies with the Commission's Report and Order in
21 the Missouri Gas Energy Company rate case, Case No. GR-96-285, wherein the
22 Commission adopted the use of the NOAA 30 year normals.

23

**UNION ELECTRIC COMPANY'S ACTUAL DAILY TEMPERATURES AND
CALCULATION OF NORMALS**

Q. Did Company furnish Staff with the historical daily weather that Company used to calculate its adjustments?

A. Yes, it did. The Company furnished its version of daily STL temperatures for all days from 1 January 1930 through 30 June 1998.

Q. Did Company explain its method of calculating STL weather normals to Staff?

A. Yes, it did. The Company has informed the Staff that Company policy is to calculate weather normals with the daily temperature data that are available at the time of the calculation. For example, using the Company's temperature data, a calculation of normal heating degree-days (HDD) and cooling degree-days (CDD) for the month of April, 1998 at STL would be the average of monthly total HDD and CDD for April from the years of 1930 through 1998. This would result in HDD and CDD normals for each of the twelve calendar months that differed by small amounts in the sharing periods ending in 1996, 1997 and 1998.

Q. Did the Staff calculate sharing period actual and normal calendar month HDD and CDD from the Company's version of STL daily temperatures?

A. Yes, it did. The Staff's calculations of the Company's adjustments from actual HDD and CDD to normal HDD and CDD are shown on Schedule 1, attached to my direct testimony. The details of these calculations are included in my working papers, as are the original STL temperature data the Staff obtained from the Company.

1 **STAFF'S ACTUAL AND NORMAL DAILY TEMPERATURES**

2 Q. Can you briefly describe the adjustments made to temperatures for
3 STL by Dr. Hu?

4 A. Yes, I can. Dr. Hu furnished corrected daily maximum and minimum
5 STL temperatures for portions of the temperature data from January 1, 1961 through June
6 30, 1998, in order to make the data series consistent with the current weather instruments
7 and station location. Dr. Hu's STL temperatures match official NOAA records for the
8 months January, 1961 through January, 1978. They are 0.3 degrees F cooler than official
9 records for the months February, 1978 through January, 1988. They are then 0.75
10 degrees F cooler than official records for the months February, 1988 through May, 1996.
11 From June 1, 1996 forward, Dr. Hu's daily temperatures match official records. In his
12 direct testimony, Dr. Hu describes how he calculated the adjustments to STL daily
13 temperatures that make them consistent throughout.

14 Q. Does Dr. Hu testify to the time period to be used in the calculation of
15 weather normals?

16 A. Yes, he does. On Page 6 of his direct testimony, Dr. Hu notes that the
17 U.S. National Weather Service (NWS) accepts the World Meteorological Organization
18 (WMO) standard 30-year time period for the development of climate normals. Currently,
19 the three decades from 1961 through 1990 are the normals period used by NOAA and
20 NWS.

21 Q. Has the Commission made any findings on the use of NOAA's 30-year
22 normals period?

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1 A. Yes, it has. The Commission's MGE Case No. GR-96-285 Report and
2 Order states: "The Commission finds that NOAA's 30-year normals is the more
3 appropriate benchmark ... In addition, the data upon which Staff's recommendation is
4 based has gone through the processes established by NOAA to ensure the best data
5 possible." Re Missouri Gas Energy, Report and Order, Case No. ER-96-285, 5 Mo.
6 P.S.C. 3d 437, 446 (1997).

7 Q. Did the Staff use weather normals from the time period 1961 through
8 1990 to calculate corrections for the Company's adjustments?

9 A. Yes, it did. The Staff calculated calendar month average temperatures,
10 HDD, and CDD over the thirty years, from Dr. Hu's STL daily temperatures. The Staff
11 then used these calendar month averages as STL climate normals. The Staff's sharing
12 period actual and normal calendar month HDD and CDD are included in my working
13 papers. Dr. Hu's data set of consistent daily temperatures for STL is also included in
14 these working papers. The Staff's adjustments from actual HDD and CDD to normal
15 HDD and CDD are shown on Schedule 2, attached to my direct testimony.

16
17 **STAFF'S CORRECTION OF UNION ELECTRIC COMPANY'S**
18 **ADJUSTMENTS FROM ACTUAL TO NORMAL WEATHER**

19 Q. Did the Company provide calendar month actual HDD and CDD,
20 normal HDD and CDD, and the calendar month adjustments from actual to normal HDD
21 and CDD for the revenue sharing periods?

22 A. No, it did not. As described previously, the Staff calculated these
23 quantities from the Company's data set of daily temperatures, using the Company's

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1 method of calculating new normals for each calendar month. The results are shown on
2 Schedule 1.

3 Q. Did the Staff calculate corrections for the Company's adjustments of
4 actual HDD and CDD to normal HDD and CDD for the differences between the
5 Company's treatment of the weather data and the recommendations of Dr. Hu?

6 A. Yes, it did. The Staff calculated these corrections for each of the 36
7 calendar months of the three years of the first experimental alternative regulation plan.
8 The Staff's corrections to the Company's adjustments, for the differences between the
9 Company's treatment of the weather and Dr. Hu's recommendations, are shown on
10 Schedule 3. The corrections on Schedule 3 are calculated as the Staff's weather
11 adjustment (Schedule 2) minus the Company's weather adjustment (Schedule 1).

12
13 **STAFF'S CORRECTION OF UNION ELECTRIC COMPANY'S EARNINGS**

14 **SHARING ADJUSTMENTS FOR DIFFERENCES IN WEATHER**

15 Q. Did the Company provide the calendar month billing data used to
16 calculate earnings sharing adjustments for the difference between actual and normal
17 weather at STL?

18 A. Yes, it did. The Company has provided a data set containing these
19 adjustments for each of the 36 calendar months in the three-year earnings sharing period
20 at issue, and for the six rate classes agreed to at Attachment A of the Stipulation and
21 Agreement in Case No. EM-96-149 respecting Union Electric's first experimental
22 alternative regulation plan.

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1 Q. What steps did you follow to correct the Company's earnings sharing
2 adjustments for the differences between the Company's treatment of STL weather and Dr.
3 Hu's recommendations?

4 A. Based on the Company's adjustments, I calculated corrections in four
5 steps:

6 Step 1: Classify each month as a heating, cooling or transition month.

7 Step 2: Calculate weather response per degree-day for heating and
8 cooling months for each class of service, as MWh per HDD for heating months, and
9 MWh per CDD for cooling months.

10 Step 3: Calculate weather response per degree-day for transition months,
11 using average MWh per degree-day from the heating and cooling months.

12 Step 4: Calculate MWh corrections for differences between the Company's
13 weather and Dr. Hu's recommendations, using the weather responses calculated in 2 and
14 3 above and the weather corrections shown on Schedule 3.

15 Q. Did any of the Company's earnings sharing adjustments receive
16 special treatment?

17 A. Yes, they did. I calculated corrections differently for June, 1997,
18 where the Company's initial MWh adjustments per CDD were extreme. I did not
19 calculate corrections for certain transition months, where the Company's MWh
20 adjustments were not only small but opposite in sign to the MWh per degree-day
21 adjustment from the heating and cooling months. Finally, I made no heating month
22 corrections for either the Large Primary or Small Primary Commercial classes, since an
23 independent analysis showed that neither class was sensitive to changes in HDD.

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Dennis Patterson

1 Q. What are the results of your corrections?

2 A. The results are found on Schedule 4, attached to my direct testimony.

3 The details of the Staff's corrections are found in my working papers.

4 Q. Does this conclude your direct testimony?

5 A. Yes, it does.

UNION ELECTRIC COMPANY CASE NO. EO-96-14

**Staff's Calculation of
Union Electric Company's Adjustments from Actual to Normal (N-A)
Heating Degree Days (HDD) and Cooling Degree Days (CDD)
for St. Louis Lambert International Airport**

Union Electric Company Adjustments		
	HDD(N-A)	CDD(N-A)
July-95	0.23	(51.12)
August-95	1.32	(193.61)
September-95	(21.73)	36.42
October-95	68.71	3.57
November-95	(66.67)	2.99
December-95	(17.90)	0.08
January-96	(31.08)	0.04
February-96	52.04	(4.23)
March-96	(92.33)	4.61
April-96	(25.25)	17.25
May-96	27.01	(93.81)
June-96	1.16	(36.88)
Year 1	(104.51)	(314.70)

Union Electric Company Adjustments		
	HDD(N-A)	CDD(N-A)
July-96	0.22	55.04
August-96	1.30	(59.22)
September-96	13.07	34.40
October-96	47.99	1.54
November-96	(117.89)	2.95
December-96	93.19	0.07
January-97	(52.30)	0.04
February-97	157.19	0.26
March-97	169.15	1.59
April-97	(66.75)	26.85
May-97	(12.80)	53.39
June-97	6.07	(1.36)
Year 2	238.42	115.56

Union Electric Company Adjustments		
	HDD(N-A)	CDD(N-A)
July-97	0.22	(78.78)
August-97	1.28	(7.11)
September-97	40.96	(23.75)
October-97	3.43	(74.84)
November-97	(27.48)	2.41
December-97	76.54	0.07
January-98	244.60	0.04
February-98	269.72	0.26
March-98	5.57	(24.55)
April-98	57.41	16.60
May-98	78.54	(149.41)
June-98	(9.79)	(73.28)
Year 3	741.01	(412.33)

Union Electric Company Adjustments		
	HDD(N-A)	CDD(N-A)
Three-year Average:	291.64	(203.82)

UNION ELECTRIC COMPANY CASE NO. EO-96-14

**Staff's Adjustments
from Actual to Normal (N-A)
Heating Degree Days (HDD) and Cooling Degree Days (CDD)
for St. Louis Lambert International Airport**

Staff's Adjustments		
	HDD(N-A)	CDD(N-A)
July-95	0.47	(46.99)
August-95	1.64	(198.32)
September-95	(26.32)	38.35
October-95	75.88	(2.54)
November-95	(99.71)	2.78
December-95	(1.50)	0.15
January-96	2.06	0.00
February-96	75.06	(3.75)
March-96	(121.87)	5.67
April-96	(41.26)	21.36
May-96	19.41	(59.50)
June-96	(7.33)	(8.57)
Year 1	(123.46)	(251.37)

Staff's Adjustments		
	HDD(N-A)	CDD(N-A)
July-96	0.47	98.76
August-96	1.64	(26.07)
September-96	(12.82)	52.35
October-96	23.88	10.71
November-96	(187.21)	2.78
December-96	72.25	0.15
January-97	(58.69)	0.00
February-97	147.56	0.00
March-97	105.38	4.67
April-97	(121.51)	31.11
May-97	(48.84)	66.50
June-97	1.17	30.43
Year 2	(76.71)	271.38

Staff's Adjustments		
	HDD(N-A)	CDD(N-A)
July-97	0.47	(35.74)
August-97	1.64	23.93
September-97	34.18	11.35
October-97	(13.62)	(60.30)
November-97	(99.71)	2.78
December-97	58.25	0.15
January-98	241.81	0.00
February-98	271.56	0.00
March-98	(49.62)	(13.83)
April-98	4.99	25.11
May-98	77.16	(105.00)
June-98	(18.33)	(46.07)
Year 3	508.79	(197.62)

Staff's Adjustments		
	HDD(N-A)	CDD(N-A)
Three-year Average:	102.87	(59.20)

UNION ELECTRIC COMPANY CASE NO. EO-96-14

**Staff's Corrections to Union Electric Company's Degree-Day Adjustments
from Actual to Normal (N-A) Heating Degree Days (HDD) and Cooling Degree Days (CDD)
for Differences between Union Electric Company's Treatment of Weather Data and
The Recommendations of Steve Qi Hu, PhD.**

Corrections (Staff - Union Electric)		
	HDD(N-A)	CDD(N-A)
July-95	0.24	4.13
August-95	0.32	(4.70)
September-95	(4.58)	1.93
October-95	7.17	(6.11)
November-95	(33.03)	(0.22)
December-95	16.41	0.07
January-96	33.14	(0.04)
February-96	23.02	0.48
March-96	(29.54)	1.06
April-96	(16.01)	4.11
May-96	(7.60)	34.32
June-96	(8.49)	28.31
Year 1	(18.95)	63.34

Corrections (Staff - Union Electric)		
	HDD(N-A)	CDD(N-A)
July-96	0.24	43.71
August-96	0.34	33.15
September-96	(25.89)	17.95
October-96	(24.11)	9.16
November-96	(69.32)	(0.17)
December-96	(20.93)	0.07
January-97	(6.39)	(0.04)
February-97	(9.63)	(0.26)
March-97	(63.77)	3.09
April-97	(54.76)	4.26
May-97	(36.04)	13.11
June-97	(4.90)	31.79
Year 2	(315.14)	155.82

Corrections (Staff - Union Electric)		
	HDD(N-A)	CDD(N-A)
July-97	0.25	43.04
August-97	0.36	31.04
September-97	(6.77)	35.10
October-97	(17.05)	14.54
November-97	(72.23)	0.36
December-97	(18.29)	0.07
January-98	(2.79)	(0.04)
February-98	1.84	(0.26)
March-98	(55.18)	10.72
April-98	(52.42)	8.51
May-98	(1.38)	44.42
June-98	(8.54)	27.22
Year 3	(232.22)	214.72

Corrections (Staff - Union Electric)		
	HDD(N-A)	CDD(N-A)
Three-year Average:	(188.77)	144.62

UNION ELECTRIC COMPANY CASE NO. EO-96-14

**Staff's Corrections to Union Electric Company's Experimental Alternative Regulation Plan
Earnings Sharing Adjustments in MegaWatt-hours
Sums over Stipulated Rate Classes**

Calendar Month	UE's Adjustment Total MWH	Staff's Correction Total MWH	Corrected MWH Adjustment
Jul-95	-124,531	10,060	-114,471
Aug-95	-437,522	-10,632	-448,154
Sep-95	50,407	892	51,299
Oct-95	17,169	-4,193	12,976
Nov-95	-32,627	-16,362	-48,989
Dec-95	-11,001	9,352	-1,649
Jan-96	-18,804	18,747	-57
Feb-96	45,792	33,503	79,295
Mar-96	-56,507	-17,839	-74,346
Apr-96	-3,981	0	-3,981
May-96	-112,392	33,346	-79,046
Jun-96	-109,527	78,509	-31,018
Year 1	-793,524	135,383	-658,141

Calendar Month	UE's Adjustment Total MWH	Staff's Correction Total MWH	Corrected MWH Adjustment
Jul-96	132,600	105,304	237,904
Aug-96	-121,031	67,751	-53,280
Sep-96	29,704	6,820	36,524
Oct-96	5,221	1,735	6,956
Nov-96	-58,629	-34,926	-93,555
Dec-96	53,285	-11,735	41,550
Jan-97	-36,042	-3,915	-39,957
Feb-97	81,876	-4,911	76,965
Mar-97	86,988	-32,911	54,077
Apr-97	-8,349	0	-8,349
May-97	31,649	1,046	32,695
Jun-97	-27,876	72,991	45,115
Year 2	169,396	167,247	336,643

Calendar Month	UE's Adjustment Total MWH	Staff's Correction Total MWH	Corrected Adjustment Total MWH
Jul-97	-201,289	109,966	-91,323
Aug-97	-16,844	73,537	56,693
Sep-97	-73,121	171,851	98,730
Oct-97	-151,754	18,947	-132,807
Nov-97	-9,043	-42,997	-52,040
Dec-97	56,798	-13,135	43,663
Jan-98	177,596	-1,979	175,617
Feb-98	175,252	1,161	176,413
Mar-98	-37,044	-4,848	-41,892
Apr-98	32,214	-6,535	25,679
May-98	-291,825	91,475	-200,350
Jun-98	-203,848	68,542	-135,306
Year 3	-542,908	465,984	-76,924

Years 1, 2 & 3	UE's Adjustment	+ Staff's Correction	= Corrected Adjustment
	Total MWH	Total MWH	Total MWH
3 Year Avg	-389,012	256,204	-132,808
	% of Avg Annual Sales	% of Avg Annual Sales	% of Avg Annual Sales
3 Year Avg	-1.27%	0.84%	-0.43%