DOCKET NO. 3250

APPLICATION OF TEXAS ELECTRIC SERVICE COMPANY FOR AUTHORITY TO CHANGE RATES	‖	PUBLIC UTILITY COMMISSION OF TEXAS

DIRECT TESTIMONY OF

TED VOGEL

ECONOMIC RESEARCH DIVISION

PUBLIC UTILITY COMMISSION OF TEXAS

JULY, 1980

1   Q. Please state your name and business address.

2   A. Ted Vogel, 7800 Shoal Creek Boulevard, Suite 400N, Austin, Texas. 78757.

3   Q. By whom are you employed and in what capacity?

4   A. I am employed by the Public Utility Commission of Texas as a Senior Financial

5   Analyst and Econometrician in the Economic Research Division.

6   Q. What are your principal areas of responsibility in this capacity?

7   A. I have responsibility for the development and estimation of econometric

8   models of demand, revenues, and other factors concerning public utilities

9   under the Commission's jurisdiction.

10 Q. Please state briefly your educational background and professional qualifica-

11   tions.

12 A. I received a B.S. degree with a major in accounting from Penn State

13   University, State College, Pennsylvania. After graduation, I studied

14   finance at the University of Southern California in Los Angeles and received

15   a Masters Degree in Business. Upon completion of graduate school, I moved to

16   Little Rock, Arkansas. There I worked for the Arkansas Public Service

17   Commission while studing for a Master's Degree in Public Administration.

18   Recently, I was awarded an MPA with a concentration in statistics from

19   the University of Arkansas. Currently, I am taking post-graduate courses at

20   the University of Texas at Austin.

21   I am a member of the American Finance Association, Financial Management

22   Association, American Economic Association, and the Association of Public

23   Administrators. In addition, I have attended several conferences related to

24   public utilities, namely: (1) the Public Utilities Finance Program, at the

25   University of Texas at Dallas, and (2) the Public Utility Regulation

1   Conference, under the direction of Myron Gorden and Paul Halpern, at the

2   University of Toronto, Toronto, Canada. My military experience includes

3   three (3) years in the U.S. Marine Corps.

4   Q. Have you ever testified before a commission?

5   A. Yes, I have. I was recently employed by the Arkansas Public Service

6   Commission where I testified or participated in numerous water, cooperative,

7   gas, telephone, and electric cases.

8   Q. Would you please state the purpose of your testimony in Docket No. 3250?

9   A. The testimony will involve two adjustments. First, I will discuss the

10   company's adjustment to "other O&M expenses" and propose a staff adjustment.

11   Second, I will comment on the customer, weather, and price elasticity

12   adjustments as prepared by the company. Thus, the prepared testimony has

13   been organized into two sections:

14   1. "Other operation and maintenance expense" adjustment.

15   2. Customer, weather, and price elasticity adjustments.

16   Q. You mentioned the testimony involved two adjustments. Would you please

17   mention how your testimony fits into the overall staff case in Docket No.

18   3250?

19   A. The adjustments were calculated to supplement the work of Ms. Cathy Jones,

20   PUC Chief Accountant, and Mr. Milton Lee, Assistant Director of Engineering,

21   in determining the revenue requirements and adjusted level of kwh sales.

22   These adjustments are for the purpose of normalizing revenues and

23   expenses.

24   I. OTHER OPERATION AND MAINTENANCE ADJUSTMENTS

25   Q. Did you review the company's adjustment to "other O&M expense"?

1   A. Yes.

2   Q. What is the purpose of this adjustment?

3   A. The purpose is to adjust for other types of operation and maintenance

4   expenses not accounted for elsewhere. These expenses include a voluminous

5   number of goods and services in which individual study and adjustment is

6   unfeasible. Examples of "other O&M expenses" would be customer installation

7   expenses, meter expenses, and maintenance of overhead lines.

8   Q. Do you have any comments regarding this adjustment?

9   A. Yes. The staff agrees with the general manner in which the adjustment was

10   made by Ms. Judith Voss, Senior Accountant of Texas Electric Service Company.

11   The only refinement the staff proposes is the use of the confidence interval

12   technique.

13 Q. Would you describe the staff refinement and the resulting adjustment?

14 A. Yes. The staff refinement consists of the confidence interval technique

15   which enhances the accuracy of the model proposed by the company. The

16   company used regression analysis to estimate expenses. It rendered a point

17   estimate, or mean value, for these expenses. The deficiency of a point

18   estimate is it tells nothing about reliability. By using a confidence

19   interval, we can find a measure of reliability. Thus, it can be said that 95

20   times out of 100 an estimate will be within a certain range. This is a 95

21   percent confidence interval and represents the confidence interval

22   technique. The major conceptual change is the company adjusted "other O&M

23   expenses" to the sample mean value of the estimated relationship while the

24   staff recommends an adjustment to the closest boundary of a 95 percent

25   confidence interval.

1   Q. What is the effect of the staff adjustment to the company's "other O&M"

2   adjustment?

3   A. It reduces the estimated expenses from Ms. Voss's $52,758,536 to $49,870,230;

4   the "other O&M expense" adjustment is thus reduced from $4,407,655 to

5       $1,519,350 and has been reflected in the work of Ms. Cathy Jones. See

6   Schedule I.

7   Q. Why should the adjustment be made to the closest boundary of a 95 percent

8   confidence interval rather than the sample mean?

9   A. The sample mean value is only one indicator of confidence at the 95 percent

10   level. There are many other indicators within that level and each has the

11   same probability of being the correct estimate. When making adjustments of

12   this type it is prudent to allow for the relative uncertainty inherent in

13   statistical procedures. By adjusting to the closest boundary of the

14   confidence interval the staff incorporates the above concerns.

15   Q. What methodology has the commission applied in the past?

16   A. The commission has applied the staff approach, as recommended in this docket,

17   in Dockets No. 1903, 2606, and 3006.

18   II. CUSTOMER, WEATHER, AND PRICE ELASTICITY ADJUSTMENTS

19   Q. Have you reviewed the company's proposed adjustments to kilowatt-hours (kwh)

20   for the effects of customers, weather, and price elasticity?

21   A. Yes.

22   Q. What is the purpose of these adjustments?

23   A. The purpose of these adjustments is to accurately reflect the kwh sales the

24   company will generate. Changes in certain factors affect the number of kwh's

25   sold. Known and measurable changes to test year kwh sales should be adjusted

1   to correctly represent the company's sales.

2   Q.   What is the first issue you intend to discuss?

3   A.   The first issue the staff will address is the change in the number of

4   customers. If test year figures are used without adjustment, kwh sales would

5   probably be understated. The company has adjusted the test year figures to

6   reflect the level of kwh sales that would have occurred if the year-end

7   number of customers had been served for the entire test year. The adjustment

8   is straightforward and the staff agrees with the company's methodology.

9   Q.   How did the company make the adjustment for weather and price elasticity?

10   A.   The weather coefficients and price elasticities requested were based on a

11   bifurcated analytical process. In the first instance, the weather

12   coefficients and adjustments to kwh sales were based on the work of Mr. Ted

13   Kuhn, former PUC staff member, which were approved in Dockets No. 1903 and

14   2606. For the price elasticity, the company relied upon published studies

15   and their own econometric modeling efforts to apply an elasticity of -.20 to

16   all rate groups.

17   Q.   Would you briefly describe the company's econometric modeling techniques?

18   A.   Yes. The company developed econometric models for the R, GS, SD, Y6, and W

19   rate classes. Within these models were various exogenous variables such as

20   weather, income, and electricity price. The R rate class was disaggregated

21   by division. The remaining models were aggregated on a system wide basis.

22   Data was collected on a monthly basis from January 1972 to August 1979 and

23   the company utilized regression analysis to determine the relationships

24   between the variables. The model specifications were based on the price

25   elasticity work of Houthakker and Taylor, noted researchers in the field of

1   electricity demand theory.

2 Q. Does the staff have any comment to make regarding the procedure just

3   outlined?

4 A. Yes. One of the goals of the regulatory process in consistency. The staff

5   feels it is inconsistent to use Docket No. 1903 and 2606 weather coefficients

6   and current model price elasticities when one model should explain both

7   adjustments. The staff has based its recommendations for weather and price

8   elasticity on updated econometric models incorporating both variables.

9 Q. How was the staff's econometric modeling accomplished?

10 A. The staff replicated the company's econometric models using data from

11   January 1974 to the end of the test year.

12 Q. Why did the staff use a different data period than the company?

13 A. The staff wanted to avoid any structural changes in the economy that might

14   have occured as a consequence of the Arab Oil Embargo and the resultant

15   rising price levels. It was thought the 1972-1973 period could introduce

16   bias into the estimates. Also, the staff wanted the most recent data to

17   increase the reliability of the study.

18 Q. Could you explain the steps in the staff analysis?

19 A. Yes. First, the staff obtained data from the company from January 1974 to

20   the end of the test year, March 1980. This data was operationalized to the

21   same level as that utilized by the company for the test year.

22 Q. So, what you are saying is that you developed and replicated the company's

23   econometric model to explain the impacts of weather and price on kwh sales?

24 A. Yes.

25 Q. What were the results of the modeling on the weather adjustment?

1 A. In regard to the weather adjustment, the model adjusted kwh sales to a number

2   greater than that requested by the company. The staff thus agrees to the

3   lower company adjustment of 11,791,169 kwh sales.

4 Q. What about the price adjustment?

5 A. The company uses a price elasticity of -.20 for all rate classes. The staff

6   supports an elasticity of -.20 for only the R and GS rate classes. See

7   Schedule II.

8 Q. Does an elasticity recommendation for only the R and GS rate classes mean

9   price elasticity does not exist within the other rate classes?

10 A. No, it does not. Specifically, I mean that the t-statistic on the price

11   elasticity variables were not significant at the 95 percent level. The lack

12   of a recommendation of an elasticity coefficient for the other classes is the

13   result of an unacceptable t-statistic for those rate classes.

14 Q. What is a t-statistic and how was it used in Docket No. 3250?

15 A. A t-statistic tells how important a variable is, i.e., it tells if its

16   coefficient is significantly different from zero. The bigger the t-

17   statistic, the more important, or significant, the variable is likely to be.

18   A derived t-statistic is compared with a table of t-statistics to see if it

19   is significant at a certain level, like 90, 95, or 99 percent. The 95 percent

20   level of confidence is a standard used by statisticians. Checking the t-

21   statistics, the staff found the price variables to be significant at the 95

22   percent level for the R and GS rate classes. The W and Y6 price variables

23   were significant at the 90 percent level. No independent company or staff

24   studies were conducted on the HV6, MP, GL, Y1, Y71, FSL, SL, or SD price

25   variables. Therefore, the staff made no assumptions as to price elasticity

1 for these rate classes.

2 Q. What action does the staff recommend the commission take in this matter?

3 A. The staff posits concurrence with a price elasticity adjustment of -.20 for

4 the R and GS rate classes. The basis of this recommendation is the staff's

5 modeling and verification efforts on the company data. The total price

6 elasticity adjustment then becomes 462,592,762 kwh.

7 Q. What are the effects of the total price elasticity figures on test period

8 base rate revenues?

9 A. The test period base rate revenues become $414,999,505. This number is

10 reflected in the work of Ms. Cathy Jones, in Schedule I, page 1 of 10.

11 Q. What are the effects of price elasticity on proposed rates?

12 A. The price adjustment results is a total adjustment of 452,694,125 kwh for the

13 effects of the proposed increase in Docket No. 3250. This number is

14 reflected in the work of Ms. Cathy Jones and Mr. Milton Lee. Of course, the

15 above figures are highly dependent on the precise percentage increase finally

16 approved by the commission. The staff would have to utilize computer

17 facilities to give the commission the price adjustment based on whatever

18 final approved increase is granted as it is formidible to do these

19 calculations by hand. Therefore, the above adjustments should be viewed as

20 only preliminary results as they are dependent upon the commission's final

21 order.

22 Q. Does this conclude your testimony?

23 A. Yes, it does.

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PUBLIC UTILITY COMMISSION OF TEXAS

TEXAS ELECTRIC SERVICE COMPANY
OTHER OPERATION AND MAINTENANCE EXPENSE ADJUSTMENT

Formula: $$y_+ = a + bx_+ + e_+$$

Regression equation: $$y = -232,984,900 + 556.11270 \, (513,823)$$

Regression equation: $$y = \$52,758,595.85$$

		Coefficient	t-Statistic
Parameters:	$a =$	-232,984,900	
	$b =$	556.11270	25.36
	$x_o =$	513,823	
	$y =$	\$52,758,595.85	
	$y_{LCI} =$	\$49,870,230.82	

Standard Error of the Regression	=	\$1,392,654.31
Coefficient of Determination (R^2)	=	.96693
95% Confidence Interval for $E(_y)$	=	$\pm$\$2,888,365.03

Where:

a = constant
y_+ = other O&M expense
x_+ = numbered customers
e_+ = error term, assumed random

COMPUTATION

Estimated expense for 513,823 customers = \$49,870,230.82
Actual expense for 501,736 customers = 48,350,881.00

Total "other O&M expense" adjustment = \$ 1,519,350.00

Public Utility Commission of Texas

Texas Electric Service Company
Price Variable

Rate Class	h	$\pm$
R-BSD	-.0390	-.383/60.0
R-ED	-.2471	-1.69/95.0
R-FWD	-.2899	-1.78/95.0
R-SD	-.1879	-1.80/95.0
R-WFD	-.3322	-2.56/99.0
R-WD	-.0656	-.65/70.0
R-AE	-.1934	-2.06/97.5
GS	-.2183	-2.29/97.5