

ORIGINAL

DOCKET NO. 991643-SU - APPLICATION FOR INCREASE IN WASTEWATER RATES IN SEVEN SPRINGS SYSTEM IN PASCO COUNTY BY ALOHA UTILITIES, INC.

WITNESS: DIRECT TESTIMONY OF PAUL W, STALLCUP APPEARING ON BEHALF OF THE STAFF OF THE PUBLIC SERVICE COMMISSION

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1 DIRECT TESTIMONY OF PAUL W. STALLCUP

2 Q: Would you please state your name and business address?

3 A: My name is Paul W. Stallcup. My business address is 2540
4 Shumard Oak Boulevard, Tallahassee, Florida, 32399.

5 Q: By whom and in what capacity are you employed?

6 A: I am employed by the Florida Public Service Commission as the
7 Supervisor in the Economics and Forecasting Section of the Division
8 of Economic Regulation.

9 Q: Would you please summarize your educational and professional
10 experience?

11 A: I graduated from The Florida State University in 1977 with a
12 Bachelor of Science degree in Economics with minors in Mathematics
13 and Statistics. I received my Masters of Science Degree in
14 Economics from The Florida State University in 1979 and, as a Ph.D.
15 candidate, completed the course work and doctoral examinations
16 required for that degree in 1980.

17 In 1981, I was employed by Florida Power and Light Company as
18 a Load Forecast Analyst. In this capacity, I prepared short and
19 long term forecasts of company sales, peak demand, and customer
20 growth. In 1983, I was employed by the Florida Public Service
21 Commission as an Economic Analyst and in 1991 was promoted to my
22 current position as Supervisor of the Economics and Forecast
23 Section. In this capacity, I have analyzed and made
24 recommendations concerning the forecasts of Florida's regulated
25 Electric and Telecommunications companies.

1 Q: Have you previously testified before the Florida Public
2 Service Commission?

3 A: Yes. In 1983 I testified on behalf of the Florida Public
4 Service Commission Staff in the Florida Power and Light rate case
5 (Docket No. 830465-EI), and in 1997 testified on behalf of the
6 Staff in the Florida Power Corporation's proposed buy out of
7 Orlando Cogen Limited's energy contract (Docket No. 961184-EQ).

8 Q: Would you please summarize the contents of your testimony?

9 A: The purpose of my testimony is to present the results of an
10 analysis I conducted on the Equivalent Residential Connection (ERC)
11 forecasts submitted by Aloha Utilities, Inc. for its Seven Springs
12 system (Aloha or the Utility). These forecasts are contained in
13 MFR Schedule F-10. In the Utility's original filing, the ERC
14 forecast was based on Total Customer ERCs. Also, the Utility used
15 calendar year 1999 data instead of historical base year data as
16 required by the MFRs. This forecast is contained on pages 3 and 4
17 of Schedule F-10. In response to Staff's request to correct this
18 MFR deficiency, the Utility revised its forecast to one based on
19 historical base year Residential ERCs as required by the MFRs.
20 This forecast is presented on pages 1 and 2 of Schedule F-10.

21 The Utility believes that the two forecasts are virtually
22 identical. (See Note (1) at the bottom of page 1 of Schedule F-
23 10). The Utility therefore chose to base its number of projected
24 Test Year ERCs and projection factors, which are used throughout
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1 the filing, on the information as it was originally filed and
2 presented on pages 3 and 4 of Schedule F-10.

3 To test the Utility's belief that the two forecasts are
4 virtually identical, and to determine which of the forecasts should
5 be used, I conducted two evaluations of the forecasts. The first
6 evaluation tested the Utility's belief that the two forecasts are
7 virtually identical. The second evaluation tested the Utility's
8 two forecasts against an independent projection of Test Year ERCs
9 to determine which forecast would be likely to yield a more
10 accurate result. Based on these analyses, I concluded that the two
11 forecasts are not virtually identical as the Utility believes and
12 that the revised forecast based on historical base year ERCs
13 yields a more reliable Test Year ERC Forecast.

14 Q: Would you please explain how you concluded that the two Test
15 Year ERC forecasts are not virtually identical?

16 A: Yes. My evaluation used statistical techniques to determine
17 if the projected Test Year ERCs produced by the two forecasts were
18 sufficiently close to each other to deem the difference to be
19 insignificant. In this test, the difference between the forecasts
20 is compared to each forecast model's inherent ability to explain
21 ERC growth. If the difference is less than the models' inherent
22 accuracy, one would conclude that one forecast is just as accurate
23 as the other or, in other words, that they produce virtually
24 identical results. On the other hand, if the size of this
25 difference is greater than the models' inherent range of accuracy,

1 | one would conclude that the two forecasts are not virtually
2 | identical.

3 | The calculations used to perform the test are shown in my
4 | Exhibit PWS-1. The results of these calculations show that the
5 | difference between the revised forecast of 10,330 ERCs in test year
6 | 2001 is significantly different from the originally filed forecast
7 | of 9,774.5 ERCs. That is, the difference between the forecasts can
8 | not be attributed simply to normal forecasting error. Therefore,
9 | I concluded that the two forecasts are not virtually identical.

10 | Q: Would you please explain how you concluded that the revised
11 | Utility forecast is more likely to produce reliable results?

12 | A: Yes. Because the Utility has relied on a time trend to
13 | forecast ERC growth, I constructed a separate econometric model of
14 | ERC growth. This model explains ERC growth using the rate of
15 | growth in the number of households in Pasco County as measured by
16 | the University of Florida's Bureau of Economic and Business
17 | Research. The purpose of this model is to provide a benchmark
18 | projection that can be used to test the reasonableness of the
19 | Utility's ERC forecasts.

20 | Q: Why do you believe this comparison is necessary?

21 | A: Forecasts derived from time trends incorporate within them the
22 | intrinsic assumption that the level of change in the future will be
23 | equal to the level of change observed in the historical data. This
24 | assumption ignores any other causal factors that may influence
25 | growth such as changes in economic and/or demographic conditions

1 and forces the forecasts to grow at the same level as that observed
2 in the historical data.

3 An econometric model differs from a time trend model in that
4 it incorporates changes in economic and/or demographic conditions
5 to explain growth. In periods when future conditions are very much
6 like those observed in the past, an econometric model would yield
7 forecasts that are very similar to those produced by a time trend.
8 However, when future conditions are expected to differ from those
9 observed in the past, an econometric model is capable of reflecting
10 these expected changes in its forecast. For example, if population
11 growth were expected to slow in the future, an econometric model of
12 future ERCs would show future ERC growth slowing as well. This
13 sensitivity to changing conditions can not be incorporated into a
14 time trend forecast. Thus, econometric models tend to produce more
15 reliable forecasts over a wider range of conditions.

16 Q: Do you believe that forecasts based upon time trends are
17 inappropriate for rate setting purposes?

18 A: No, not always. It should be noted that forecasts based upon
19 time trends may provide reasonably accurate ERC forecasts when
20 economic and demographic conditions are stable. Furthermore, time
21 trends are relatively easy to create since the calculations needed
22 to produce the forecasts are built into most computer spreadsheet
23 programs. I believe that these characteristics make forecasts
24 based on time trend appropriate for use in MFR filings for
25 companies like Aloha.

1 However, I also believe that it is appropriate for the
2 Commission staff to verify that the projections produced by a time
3 trend approach are appropriate for setting rates. In particular,
4 I believe that it is important to verify that the ERC growth
5 forecasts submitted by the Utility are a proper reflection of the
6 expected economic and demographic conditions in which the Utility
7 will be operating. This can be achieved by comparing the ERC
8 forecasts produced by the time trend method to those produced by an
9 econometric model. If the two approaches produce similar
10 forecasts, the Commission can have additional assurance that the
11 Company's projections are reasonable. If the two differ
12 significantly, however, the Commission may take this as a signal
13 that the trended forecasts called for by the MFRs may need to be
14 adjusted.

15 Q: How well did Aloha's two ERC forecasts compare to the
16 forecasts produced by your econometric model?

17 A: As shown in my Exhibit PWS-2, the econometric model produced
18 a Test Year Total ERC forecast of 10,229 compared to a revised
19 Utility forecast of 10,330. This difference of 101 ERCs does not
20 represent a statistically significant difference. The Utility's
21 original forecast of 9,775 ERCs, on the other hand, did differ
22 significantly from the econometric model's projection. These
23 results lead me to conclude that the Utility's revised ERC forecast
24 should be more reflective of the conditions expected to exist in
25 the test year than the originally filed forecast.

1 Q: How would the projected growth factors used by Aloha be
2 affected if its revised forecast is used instead of its originally
3 filed forecast?

4 A: There are two projected growth factors that would be affected.
5 The first is the projected growth factor used in MFR Schedule
6 E-13(A) to escalate base year bills and gallons up to test year
7 levels. The Utility's originally filed projection factor is
8 1.08535. The same factor based on it's revised forecast is
9 1.07093. This calculation is shown in my Exhibit PWS-1.

10 Note that this revised factor is slightly lower than the
11 originally filed projection factor even though the revised ERC
12 forecast is higher than the originally filed ERC forecast. This
13 apparent anomaly is attributable to the two different methodologies
14 used to calculate ERCs in the historic base year. In the original
15 filing based on Total ERCs, the 1999 number of ERCs was calculated
16 to be 9,056. In the revised filing based on Residential Customers,
17 the 1999 number of Total ERCs was 9,646. This increase in
18 historic base year Total ERCs accounts for the apparent anomaly.

19 The second affected projected growth factor occurs in multiple
20 Schedules such as MFR Schedule G-7. In Schedule G-7, as in the
21 other affected schedules, this projected growth factor is used to
22 account for the impact of forecasted ERC growth on selected O&M
23 accounts. The Utility used a factor of 1.04812 to escalate these
24 accounts from the base year of 1999 to 2000, and then again from
25 2000 to 2001. This factor was calculated by averaging the observed

1 percentage change in ERCs over the historical period from 1994 to
2 1999.

3 I recommend using a factor of 1.03486. This factor is based
4 on the percentage growth of projected ERCs from 1999 to 2001 using
5 the revised forecast. Since this growth factor is intended to
6 account for ERC growth during this period, and not over the
7 historical period, I believe my method for calculating the
8 Projected Growth Factor is more appropriate.

9 Q: Does this conclude your testimony?

10 A: Yes.

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FORECAST OF EQUIVALENT RESIDENTIAL CONNECTIONS
Utility's Revised Forecast Using Historical Time Trend

Year	Period	Total ERCs		Regression Output:	
1994	1	7,654		Constant	7385
1995	2	8,337		Std Err of Y Est	137.9159
1996	3	8,384		R Squared	0.968918
1997	4	8,870		No. of Observations	6
1998	5	9,150		Degrees of Freedom	4
1999	6	9,646			
2000	7	9,962		X Coefficient(s)	368.1429
2001	8	10,330	= X1	Std Err of Coef.	32.9682

Compound Average Annual Growth Rates

Period	Rate
1994 - 1999	4.73%
1999 - 2000	3.28%
2000 - 2001	3.70%
1999 - 2001	3.49%

Proj Factor	1.07093
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FORECAST OF EQUIVALENT RESIDENTIAL CONNECTIONS
Utility's Original Forecast Using Historical Time Trend

Year	Period	Total ERCs		Regression Output:	
1994	1	7,245		Constant	6985.733
1995	2	7,804		Std Err of Y Est	76.29963
1996	3	8,018		R Squared	0.989169
1997	4	8,380		No. of Observations	6
1998	5	8,732		Degrees of Freedom	4
1999	6	9,056			
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2000	7	9,426		X Coefficient(s)	348.6
2001	8	9,775	= X2	Std Err of Coef.	18.2391

Compound Average Annual Growth Rates

Period	Rate
1994 - 1999	4.56%
1999 - 2000	4.08%
2000 - 2001	3.70%
1999 - 2001	3.89%

Proj Factor	1.0793
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FORECAST OF EQUIVALENT RESIDENTIAL CONNECTIONS

Hypothesis Test: Difference Between Revised vs. Original Utility Forecasts

Test Type: Difference between Two Means
Crit.Value: 2.015 (2-tailed t distribution: 5 degrees of freedom @ 90% confidence level)
Null Hypo.: Two Means are Equal
Alt. Hypo.: Two Means are not Equal

Parameter	Revised	Original	
n	6	6	n = number of observations
s ²	19,021	5,822	s = std error of Y est from pp. 1 and 2

Test Statistics		
S ²	12,421	
(X1 -X2)	556	X1 from p. 1; X2 from p. 2
t-statistic	8.63	

**Conclusion: t-statistic is greater than critical value.
Conclude two means are not equal.**

TEST OF FORECAST METHODOLOGIES

Hypothesis Test: Utility's Total ERCs (Revised) by Time Trend vs. Staff's ERCs by Econometric Model

Year	per U of F: Pasco H Holds	Utility's Revised ERCs		Regression Output:	
1994	129,501	7,654		Constant	-7342.51
1995	132,542	8,337		Std Err of Y Est	144.678
1996	135,871	8,384		R Squared	0.965796
1997	139,038	8,870		No. of Observations	6
1998		9,150		Degrees of Freedom	4
1999		9,646			
2000	148,392	9,958		X Coefficient(s)	0.116587
2001	150,721	10,229 = X2		Std Err of Coef.	0.01097

Hypothesis Test:

Null Hypo. No Difference between Revised Utility Forecast and Econometric Model Forecast
 Alt. Hypo. Revised Utility Forecast and Econometric Model Forecast are Different
 Critical Value: 2.015 (2-tailed t distribution: 5 degrees of freedom @ 90% confidence level)

Parameter	Revised	Econ.
n	6	6
s ²	19,021	20,932

n = number of observations revised from Exh PWS-1, p. 3; econ = square of std error of Y est above

Test Statistics

S ²	19,976
(X1 - X2)	101
t-statistic	1.23

X1 from Exh PWS-1, p. 1; X2 from above

Conclusion: t-statistic is less than critical value.
 Conclude two means are equal.

TEST OF FORECAST METHODOLOGIES

Hypothesis Test: Utility's Total ERCs (Original) by Time Trend vs. Staff's ERCs by Econometric Model

Year	per U of F: Pasco H Holds	Original ERC		Regression Output:	
1994	129,501	7,245		Constant	-6972.85
1995	132,542	7,804		Std Err of Y Est	81.449
1996	135,871	8,018		R Squared	0.987657
1997	139,038	8,380		No. of Observations	6
1998		8,732		Degrees of Freedom	4
1999		9,056			
2000	148,392	9,423		X Coefficient(s)	0.110491
2001	150,721	9,680 = X2		Std Err of Coef.	0.006176

Hypothesis Test:

Null Hypo. No Difference between Original Company Forecast and Econometric Model Forecast
 Alt. Hypo. Original Company Forecast and Econometric Model Forecast are Different
 Critical Value: 2.015 (2-tailed t distribution: 5 degrees of freedom @ 90% confidence level)

Parameter	Original	Econ.
n	6	6
s ²	5,822	6,634

n = number of observations
 original from Exh PWS-1, p. 3; econ = square of std error of Y est above

Test Statistics

S ²	6,228
(X1 - X2)	94
t-statistic	2.06

X2 from Exh PWS-1, p. 2; X2 from above

**Conclusion: t-statistic is greater than critical value.
 Conclude two means are not equal.**