Results of the

2009 Cost of Service

Load Research Study

INTRODUCTION

 The purpose of this document is to meet the filing requirements of the Cost of Service Load Research Rule, Docket No. 820491-EU, Order No. 13026, issued February 23, 1984, by the Florida Public Service Commission (FPSC). This rule was amended by the FPSC on January 6, 2004.

 This rule requires the reporting of results of each load research study conducted in accordance with the specifications of this rule. The results reported here are for load research studies conducted based on data collected between January 1, 2009, and December 31, 2009. The Load Research Sampling Plan that was used in this study was approved by the Commission in 2008.

 A rate data summary is provided on Tables 1A and 1B and provides a comparison of various significant variables between rate classes. The number of sample points for each rate class is provided in these tables, as well as the coincident system peak (CP) demand, summer and winter CP demands, and relative accuracies. Table 1C provides, for each rate class, load factors based on the average of the 12 CPKW and on each rate class NCPKW. Table 2 shows the sample sizes for all rates by strata.

TABLE 1A

Rate Data Summary

2009

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Year End | Annual | % of | System CP | % of |
| Rate | Customers | MWh | Total | kW (2009) | Total |
|  |  |  |  |  |  |
| RS  | 363,417 | 5,029,385 | 42.1% | 1,241,857 | 48.9% |
|  |  |  |  |  |  |
| RSVP | 8,950 | 163,940 | 1.4% | 35,540 | 1.4% |
|  |  |  |  |  |  |
| GS  | 28,477 | 278,596 | 2.3% | 59,523 | 2.4% |
|  |  |  |  |  |  |
| GSD/GSDT/GS-TOU | 16,951 | 2,608,987 | 21.8% | 494,719 | 19.5% |
|  |  |  |  |  |  |
| LP | 195 | 545,057 | 4.6% | 87,660 | 3.5% |
|  |  |  |  |   |  |
| LPT | 113 | 1,222,967 | 10.2% | 190,068 | 7.5% |
|  |  |  |  |   |  |
| RTP | 25 | 717,287 | 6.0% | 87,096 | 3.4% |
|  |  |  |  |  |  |
| SBS | 3 | 80,095 | 0.7% | 572 | 0.0% |
|  |  |  |  |  |  |
| Others (1) | 10,023 | 1,311,041 | 11.0% | 340,630 | 13.4% |
|  |  |  |  |  |  |
| TOTAL |  428,154  |  11,957,355  |  100.0% |  2,537,665  |  100.0% |

(1)  Sales for Resale, Unbilled, Rates OS and CISR, Company Use and Losses.

TABLE 1B

Rate Data Summary

2009

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Sample | % of |  | Summer | Relative |  | Winter | Relative |
| Rate | Points | Total |  | CPKW | Accuracy (%) |  | CPKW | Accuracy (%) |
|  |  |  |  |  |  |  |  |  |
| RS  | 225 | 21.4% |  | 1,241,857 | 5.91 |  | 1,254,706 | 6.54 |
|  |  |  |  |  |  |  |  |  |
| RSVP | 240 | 22.8% |  | 35,540 | 4.27 |  | 25,920 | 8.27 |
|  |  |  |  |  |  |  |  |  |
| GS  | 300 | 28.5% |  | 59,523 | 6.13 |  | 57,279 | 9.27 |
|  |  |  |  |  |  |  |  |  |
| GSD/GSDT/GS-TOU | 160 | 15.2% |  | 494,719 | 4.81 |  | 355,172 | 7.78 |
|  |  |  |  |  |  |  |  |  |
| LP | 54 | 5.1% |  | 87,660 | 5.61 |  | 59,978 | 8.06 |
|  |  |  |  |   |  |  |  |  |
| LPT | 44 | 4.2% |  | 190,068 | 1.18 |  | 146,093 | 2.03 |
|  |  |  |  |   |  |  |  |  |
| RTP | 24 | 2.3% |  | 87,096 | 0.00 |  | 88,627 | 0.00 |
|  |  |  |  |  |  |  |  |  |
| SBS | 3 | 0.3% |  | 572 | 0.00 |  | 930 | 0.00 |
|  |  |  |  |  |  |  |  |  |
| Others (1) | 3 | 0.3% |  | 340,630 | N/A |  | 321,180 | N/A |
|  |  |   |  |  |  |  |  |  |
| TOTAL | 1053 | 100.0% |  | 2,537,665 | N/A |  | 2,309,885 | N/A |

(1)  Sales for Resale, Rates OS and CISR, Company Use and Losses.

TABLE 1C

Load Factors

2009

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |  |
|  |  Average |  |  Annual |  | Average 12 CPKW | Rate NCPKW |
| Rate | 12 CPKW | Rate NCPKW | MWh |  | Load Factor | Load Factor |
|  |  |  |  |  |  |  |
| RS | 1,016,504 | 1,261,150 | 5,029,384 |  | 0.565 | 0.455 |
|  |  |  |  |  |  |  |
| RSVP | 25,826 | 46,027 | 163,940 |  | 0.725 | 0.407 |
|  |  |  |  |  |  |  |
| GS | 50,722 | 69,337 | 278,596 |  | 0.627 | 0.459 |
|  |  |  |  |  |  |  |
| GSD/GSDT /GS-TOU | 406,090 | 535,406 | 2,608,986 |  | 0.733 | 0.556 |
|  |  |  |  |  |  |  |
| LP | 75,258 | 98,045 | 545,057 |  | 0.827 | 0.635 |
|  |  |  |  |  |  |  |
| LPT | 165,964 | 205,569 | 1,222,967 |  | 0.841 | 0.679 |
|  |  |  |  |  |  |  |
| RTP | 90,131 | 128,349 | 717,287 |  | 0.908 | 0.638 |
|  |  |  |  |  |  |  |
| SBS | 6,534 | 46,576 | 80,095 |  | 1.399 | 0.196 |

 TABLE 2

|  |  |  |  |
| --- | --- | --- | --- |
| **GULF POWER COMPANY** |  |  |  |
|  **2009 Cost of Service Load Research Rule Sample Size**  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
|  | **Rate** |  |  | **Strata Allocation** | **Sample Size** |  |
|  |  |  |  |  |  |  |  |
|  | RS |  | 1) | Multifamily | 59 |  |  |
|  |  |  | 2) | Mobile Home | 28 |  |  |
|  |  |  | 3) | SFD 1150-1950 kWh | 46 |  |  |
|  |  |  | 4) | SFD GE 1950 kWh | 45 |  |  |
|  |  |  | 5) | SFD 0-1150 kWh | 47 |  |  |
|  |  |  |  | TOTAL | 225 |  |  |
|  |  |  |  |  |  |  |  |
|  | GS |  | 1) | 0-675 kWh | 72 |  |  |
|  |  |  | 2) | 675-1425 kWh | 79 |  |  |
|  |  |  | 3) | 1425-2300 kWh | 75 |  |  |
|  |  |  | 4) | over 2300 kWh | 74 |  |  |
|  |  |  |  | TOTAL | 300 |  |  |
|  |  |  |  |  |  |  |  |
|  | GSD |  | 1) | 0-20.0 kW | 30 |  |  |
|  |  |  | 2) | 20.1-50.0 kW | 45 |  |  |
|  |  |  | 3) | 50.1-130.0 kW | 45 |  |  |
|  |  |  | 4) | over 130.0 kW | 40 |  |  |
|  |  |  |  | TOTAL | 160 |  |  |
|  |  |  |  |  |  |  |  |
|  | LP |  | 1) | Less than 800 kW | 30 |  |  |
|  |  |  | 2) | 800 kW and greater | 40 |  | (census) |
|  |  |  |  | TOTAL | 70 |  |  |
|  |  |  |  |  |  |  |  |
|  | LPT |  | 1) | Less than 1000 kW | 20 |  |  |
|  |  |  | 2) | 1000 kW and greater | 40 |  | (census) |
|  |  |  |  | TOTAL | 60 |  |  |
|  |  |  |  |  |  |  |  |
|  | RTP |  | 1) | All customers | 24 |  | (census) |
|  |  |  |  |  |  |  |  |
|  | SBS |  | 1) | All customers | 3 |  | (census) |
|  |  |  |  |  |  |  |  |
|  | CISR |  | 1) | All customers | 1 |  | (census) |
|  |  |  |  |  |  |  |  |
|  |  |  |  | TOTAL | 843 |  |  |

DATA ANALYSIS METHODOLOGY

 Load profiles for each rate schedule were estimated using the combined ratio technique. The equation used to calculate the demand estimate for each hour of the year is provided below. The definitions for the variables for these formulas are provided in Table 3.

 **L**

 **∑**

 **h = 1**

 **= \* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ = R**

 **L**

 **∑**

 **h = 1**

The variance of each hourly demand is estimated as follows:

 **=**

 **h = 1**

The 90% confidence interval is:

 CI **=** 1.645

 ^

And relative accuracy = (CI/



 Load profiles were balanced to territorial input as follows:

(Input kW) - (Losses) - (Rate 1 kW) - (Rate 2 kW) - . . .

 - (Rate nkW) = Residual kW

 This residual profile was distributed to the rate schedule profiles by allocating on the standard deviation(s) of the demand estimate, i.e.:

 Si

Ratei kW = Ratei kw + Residual kW \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 S1 + S2 + . . . + Si + . . . + Sn

The coincident and non-coincident demands and residential load profile shown in this report have been adjusted per this balancing process. Confidence intervals and relative accuracies are based on unadjusted estimates of demand. The average of the estimated peak demand, confidence intervals, and relative accuracies are also based on unadjusted estimates of demand.

TABLE 3

Definitions for Formulas

 ^

 Ty = Estimated Population Hourly kW

 Tx = Population Monthly kWh

 ^

 R = Ratio Estimator

 yh = Stratum Sample Average Hourly kWh

 xh = Stratum Sample Average Monthly kWh

^ ^ ^

V(Ty) = Estimated Variance of Ty

 nh = Number of Good Sample Points in Stratum h

 Nh = Population Number of Customers in stratum h

Syh = Stratum Sample Standard Deviation of kW

Sxh = Stratum Sample Standard Deviation of kWh

rh = Stratum Correlation Coefficient Between kW & kWh

## Subscripts

 h = Stratum number v = kW variable

 L = Total Number of Strata x = kWh variable

STUDY RESULTS

 Provided on the following pages are the rate class estimated non-coincident and coincident peak kW demands for each month of the year 2009. The relative accuracy and the confidence interval at the 90% confidence level are also provided. Results for rate classes RS, RSVP, GS, GSD/GSDT/GS-TOU, LP, LPT, RTP, and SBS are included. Provided also on Table 4 are the monthly coincident and non-coincident peak dates and times.

 













