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GULF POWER
A SOUTHERN COMPANY

July 1, 2002

Ms. Blanca S. Bayo, Director
Division of the Commission Clerk and Administrative Services
Florida Public Service Commission
2540 Shumard Oak Boulevard
Tallahassee FL 32399-0870

Dear Ms. Bayo:

Enclosed are an original and fifteen copies of Gulf Power Company's 2003 Cost of Service Load Research Study which is filed pursuant to Rule 25.6.0437(7).

Sincerely,

Susan D. Ritenour

Susan D. Ritenour
Assistant Secretary and Assistant Treasurer

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Enclosure

GULF POWER COMPANY

Cost of Service Load Research Plan

2003

June 2002

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INTRODUCTION

The purpose of this load research plan is to ensure compliance with the Cost of Service Load Research Rule, Docket No. 820491-EU, Order No. 13026, issued 02-23-84 by the Florida Public Service Commission.

This rule requires that all subject utilities shall provide for load research sampling of all rate classes that account for more than one percent of their annual retail sales and that the sampling plan shall be designed to provide estimates of the summer and winter peak demand by class and the averages of the twelve monthly coincident peaks for each class within plus or minus ten percent relative accuracy at the ninety percent confidence level. It further states that each subject utility shall submit a currently revised sampling plan to the Commission no less than every two years. Gulf Power Company submitted its initial sampling plan in May, 1984 and the plan was approved by the Commission in August, 1984.

Provided in Table 1 are the applicable rate classes subject to this rule for Gulf Power Company and their 2001 energy relationship to the total retail energy sales. As shown on this table, rate classes RS, GS, GSD, LP, LPT, RTP and CISR/CSA are subject to the requirements of this rule.

TABLE 1

GULF POWER COMPANY
Energy By Rate

Rate	2001 MWh	% of Total Energy
RS	4,713,279	46.29%
GS	256,183	2.52%
GSD/GSDT	2,282,311	22.41%
LP	543,420	5.34%
LPT	1,399,227	13.74%
PXT	15,558	0.15%
RTP	430,352	4.23%
OS-I & OS-II	91,968	0.90%
OS-III	28,161	0.28%
OS-IV	3,760	0.04%
SBS	87,004	0.85%
CISR/CSA	331,815	3.26%
TOTAL	10,183,038	100.00%

(1) Excludes unbilled, Interdepartmental, company use and losses.

PREVIOUS SAMPLE DESIGN PLAN

The 2001 Load Research Study used the combined ratio estimator methodology for sample size estimates in all rate classes. Sample points were allocated to the various strata using the Neyman allocation procedure. Provided in Table 2 is a summary of the 2001 sample size for each of the applicable rate classes and the strata allocation variable with the strata limits.

The RS rate class, which represents 46 percent of the total Company's annual kWh retail sales, was prestratified into six strata based on housing type and winter peak month usage. The break points were 900 kWh for multifamily and 1250 and 2000 kWh for single family detached.

The GS rate class sample design was prestratified by kWh into four strata based on winter peak month usage with break points at 500, 1000, and 1700 kWh. The GS class accounts for only 2.5 percent of the Company's annual kWh retail sales.

The GSD rate class, accounting for 22 percent of the Company's annual kWh retail sales, was prestratified on the winter peak month kW demand with strata break points of 20.0 kW, 50.0 kW and 130.0 kW.

The LP rate class was prestratified into two groups. The first stratum contained a random sampling of 30 customers out of approximately 114 customers whose billing demand during January was lower than 800 kW. The second stratum was a census of all customers whose billing demand was 800 kW or higher. The LP rate

class accounts for 5.3 percent of the Company's annual kWh retail sales.

The LPT rate class was prestratified into two groups. The first stratum contained a random sampling of 20 customers out of approximately 84 customers whose billing demand during January was lower than 1,000 kW. The second stratum was a census of all customers whose billing demand was 1,000 kW or higher. The LPT rate class accounts for 13.7 percent of the Company's annual kWh retail sales.

The PXT rate class customers, the RTP rate class customers, and the CISR/CSA customers were 100 percent metered, thus requiring no sample design.

PREVIOUS STUDY ACCURACY

The relative accuracy of the 2001 load research data based on the sample design described above is provided in Table 3 and the results obtained in this study were used in the design of the 2003 Load Research Study. The 2001 annual system peak occurred on Monday, July 23, at 4:00 p.m. while the winter peak occurred on Thursday, January 4, at 7:00 a.m. All rate classes achieved better than ten percent accuracy at the ninety percent confidence interval for the summer and winter peak period as well as for the averages of the twelve monthly coincident peaks.

TABLE 2

GULF POWER COMPANY
2001 Cost of Service Load Research Rule Sample Size

Rate		Strata Allocation	Sample Size	
RS	1)	MF GT 900 kWh	23	
	2)	MF 0-900 kWh	22	
	3)	MH	30	
	4)	SFD 1251-2000 kWh	53	
	5)	SFD GE 2001 kWh	48	
	6)	SFD 0-1250 kWh	49	
		TOTAL	225	
GS	1)	0-500 kWh	101	
	2)	501-1000 kWh	94	
	3)	1001-1700 kWh	88	
	4)	over 1700 kWh	97	
		TOTAL	380	
GSD	1)	0-20.0 kW	38	
	2)	20.1-50.0 kW	38	
	3)	50.1-130.0 kW	39	
	4)	over 130.0 kW	45	
		TOTAL	160	
LP	1)	Less than 800 kW	30	
	2)	800 kW and greater	29	(census)
		TOTAL	59	
LPT	1)	Less than 1000 kW	20	
	2)	1000 kW and greater	29	(census)
		TOTAL	49	
PXT	1)	All customers	1	(census)
RTP	1)	All customers	6	(census)
SBS	1)	All customers	2	(census)
CISR/CSA	1)	All customers	2	(census)
		TOTAL	884	

Table 3

GULF POWER COMPANY
Load Research Data
January, 2001 to December, 2001

RATE SCHEDULE RS/RST

2001	Estimated CPKW	Relative Accuracy
Winter Peak	1,202,847	5.60%
Summer Peak	1,036,640	4.02%
12 Month Avg.	900,482	2.38%

RATE SCHEDULE GS/GST

2001	Estimated CPKW	Relative Accuracy
Winter Peak	49,891	6.02%
Summer Peak	60,551	5.49%
12 Month Avg.	47,375	3.44%

RATE SCHEDULE GSD/GSDT

2001	Estimated CPKW	Relative Accuracy
Winter Peak	280,229	6.86%
Summer Peak	429,414	3.96%
12 Month Avg.	349,533	2.68%

RATE SCHEDULE LP

2001	Estimated CPKW	Relative Accuracy
Winter Peak	58,696	5.35%
Summer Peak	86,187	3.45%
12 Month Avg.	75,158	2.41%

RATE SCHEDULE LPT

2001	Estimated CPKW	Relative Accuracy
Winter Peak	150,267	1.42%
Summer Peak	203,261	0.83%
12 Month Avg.	183,109	0.59%

RATE SCHEDULE CISR/CSA

2001	Estimated CPKW	Relative Accuracy
Winter Peak	39,544	0.00%
Summer Peak	38,826	0.00%
12 Month Avg.	38,767	0.00%

RATE SCHEDULE RTP

2001	Estimated CPKW	Relative Accuracy
Winter Peak	48,220	0.00%
Summer Peak	38,120	0.00%
12 Month Avg.	48,439	0.00%

PROPOSED SAMPLE DESIGN PLAN

This sample design plan uses the data collected from the 2001 Load Research Study as required by the Cost of Service Load Research Rule, which states that ". . . any new or revised plan shall be developed using data from the utility's most current load research to determine the required sampling plan to achieve the precision required . . ".

The combined ratio estimator methodology was used for the sample size estimates for this 2003 proposed sample plan. The formulas for this plan using this method are provided in Table 4. The definitions for the variables for these formulas are provided in Table 5. Stratified random sampling was used within each rate class, except those rate classes which were census-metered, to achieve better accuracy with fewer sample points. The actual calculations for each rate class, which provide sample size determinations based on the Neyman allocation methods, are provided in the description of each rate class within this study plan.

In all rate class studies where census metering is not applicable, a new sample will be drawn from the existing population and the recorders relocated to those premises.

A summary of strata allocation and sample size for all rate classes is shown in Table 9.

TABLE 4
GULF POWER COMPANY
Formulas for Sample Plan

I. Sample Size Estimates Using Combined Ratio Estimator:

$$n = \frac{\left[\sum_{h=1}^{L} W_h \sqrt{F_h}\right]^2}{\left[\frac{D\left(\frac{\hat{T}_y}{N}\right)}{1.65}\right]^2 + \frac{1}{N}\sum_{h=1}^{L} W_h F_h}$$

$$F_h = S_{yh}^2 + \left(\hat{R}^2 * S_{xh}^2\right) - 2\hat{R} r_h * S_{yh} * S_{xh}$$

$$\hat{T}_y = \hat{R} * T_x$$

$$\hat{R} = \frac{\sum_{h=1}^{L} W_h \bar{y}_h}{\sum_{h=1}^{L} W_h \bar{x}_h}$$

II. Neyman Allocation of Sample Points to Strata:

$$n_h = \frac{W_h S_{yh}}{\sum_{h=1}^{L} W_h S_{yh}} * n$$

TABLE 5

GULF POWER COMPANY
Definitions for Formulas

n = Sample Size Estimate

n_h = Stratum Sample Size

W_h = Stratum Weight

D = Percent Relative Accuracy (0.1)

$\hat{T}_y$ = Estimated Population CPKW

N = Population Number of Customers

$\hat{R}$ = Ratio Estimator

T_x = Population kWh

$\overline{Y}_h$ = Stratum Average CPKW

S_{yh} = Stratum Standard Deviation of CPKW

$\overline{x}_h$ = Stratum Average Monthly kWh

S_{xh} = Stratum Standard Deviation of Monthly kWh

r_h = Stratum Correlation Coefficient between CPKW & Monthly kWh

Subscripts

h = Stratum number

y = CPKW variable

x = Monthly kWh variable

Residential Rate Class

The 2003 RS rate class study will use a similar design to that used in 2001. The 2001 study used stratification that was necessary in order to meet the requirements of the "Demand-Side Management Monitoring and Evaluation Plan" of Gulf Power Company, dated April 26, 1996. This plan called for the Advanced Energy Management (AEM) program's control group premise metering to be obtained from the Rate Class Load Research Study. A two-way sample design was used that incorporated a primary stratification variable of housing type and a secondary stratification variable of kWh for the single-family detached and multifamily housing types only. The only changes to the 2003 study are the breakpoints. The kWh breakpoint for multifamily will be 1,000 kWh and the two breakpoints for single family detached will be 1,450 kWh and 2,500 kWh.

The Neyman allocation of sample to strata for the 2003 study is as follows:

STR	PRIMARY STRATA DESCRIPTION	2003 SECONDARY STRATA DESCRIPTION	WINTER WSTD CPKW	MIN n	2001 INSTALLED	2003 INSTALLED
1	Multifamily	gt 1000 kWh	0.20	5	23	21
2	Multifamily	0-1000 Kwh	0.19	5	22	20
3	Mobile Home		0.28	8	30	30
4	Single Family Detached	1451 to 2500 kWh	0.49	13	53	52
5	Single Family Detached	ge 2501 kWh	0.50	14	48	52
6	Single Family Detached	0-1450 kWh	0.47	13	49	50
			2.13	58	225	225

Additional date and study design calculations for this rate class are provided in Table 6.

TABLE 6

RATES RS AND RSVP
STRATIFIED ON 2001 PREMISE TYPE AND JANUARY KWH
SIX STRATA

01/2001 PEAK

			CPKW DATA				KWH DATA					
STRATUM	WEIGHT	S.S.	AVERAGE	WGT AVG	STD DEV	WGT STD	AVERAGE	WGT AVG	STD DEV	WGT STD	(F)	CORR.
MF-GT1000	0.128773	19	3.81	0.49	1.54	0.20	1576.84	203.05	415.16	53.46	0.15	0.636353
MF-LE1000	0.144024	21	1.23	0.18	1.35	0.19	599.10	86.28	236.13	34.01	0.18	0.379327
MOBILE	0.094993	28	2.68	0.25	2.97	0.28	1488.32	141.38	1122.32	106.61	0.19	0.750401
SF-1451*2500	0.181618	41	5.37	0.98	2.68	0.49	2012.83	365.57	295.90	53.74	0.46	0.369218
SF-GE2501	0.163450	51	8.41	1.37	3.04	0.50	3381.90	552.77	663.87	108.51	0.46	0.382641
SF-LE1450	0.287142	48	1.46	0.42	1.63	0.47	762.75	219.02	388.50	111.55	0.37	0.605768
TOTAL				3.69		2.13		1568.0743605			1.81	

RATIO R_HAT = 0.00235
POP. # CUST.:320546 POP. ENERGY : 532467764
POP. CPKW : 1253417 POP. KW/C 3.91

ESTIMATES FOR 90% C.I., 10% RELATIVE ACCURACY
MEAN PER UNIT SAMPLE SIZE ESTIMATE = 89.69
RATIO METHOD SAMPLE SIZE ESTIMATE = 58.27

07/2001 PEAK

			CPKW DATA				KWH DATA					
STRATUM	WEIGHT	S.S.	AVERAGE	WGT AVG	STD DEV	WGT STD	AVERAGE	WGT AVG	STD DEV	WGT STD	(F)	CORR.
MF-GT1000	0.128773	19	1.83	0.24	1.07	0.14	1150.26	148.12	298.23	38.40	0.14	0.326514
MF-LE1000	0.144024	24	2.42	0.35	1.59	0.23	1068.04	153.82	544.03	78.35	0.16	0.698856
MOBILE	0.094993	25	3.46	0.33	2.20	0.21	1480.80	140.67	844.64	80.24	0.11	0.836110
SF-1451*2500	0.181618	44	4.05	0.74	2.02	0.37	1935.75	351.57	731.56	132.86	0.26	0.710453
SF-GE2501	0.163450	53	4.91	0.80	2.23	0.36	2270.15	371.06	1034.94	169.16	0.25	0.759697
SF-LE1450	0.287142	50	3.00	0.86	1.78	0.51	1394.48	400.41	760.57	218.39	0.28	0.833820
TOTAL				3.31		1.82		1565.6490964			1.21	

RATIO R_HAT = 0.00212
POP. # CUST.:324127 POP. ENERGY : 509156343
POP. CPKW : 1077279 POP. KW/C 3.32

ESTIMATES FOR 90% C.I., 10% RELATIVE ACCURACY
MEAN PER UNIT SAMPLE SIZE ESTIMATE = 81.51
RATIO METHOD SAMPLE SIZE ESTIMATE = 35.73

GENERAL SERVICE (NON-DEMAND) RATE CLASS

The 2001 study contained a total of 380 sample points stratified on winter peak month energy with strata break points at 500, 1,000, and 1,700 kWh. The resulting accuracy did meet the target accuracy of 10 percent at the 90 percent confidence level during both winter and summer peaks. Since the target accuracy was met, the basic sample design will be kept for 2003 with minor changes in the breakpoints. The 2003 GS rate class is prestratified into four strata with breakpoints at 650, 1,350, and 2,250 kWh of the average of January and February energy.

Shown below is the Neyman allocation of sample to strata for the 2003 study.

	WINTER		
STR	WSTD CPKW	MIN n	INSTALLED n
1	0.38	32	107
2	0.34	29	95
3	0.32	27	89
4	0.32	27	89
	1.36	115	380

Additional statistical data and study design calculations for this rate class are provided in Table 7.

TABLE 7

RATES GS
ONE-WAY STRATIFICATION ON AVERAGE of FEB AND JAN KWH

01/2001 PEAK

			]----------CPKW DATA----------]				]----------KWH DATA----------]					
STRATUM	WEIGHT	S.S.	AVERAGE	WGT AVG	STD DEV	WGT STD	AVERAGE	WGT AVG	STD DEV	WGT STD	(F)	CORR.
0- 650	0.574293	111	0.40	0.23	0.66	0.38	270.30	155.23	232.79	133.69	0.30	0.620941
651-1350	0.206891	91	2.00	0.41	1.66	0.34	1083.14	224.09	319.46	66.09	0.30	0.511518
1351-2250	0.144373	71	4.25	0.61	2.19	0.32	2128.52	307.30	440.31	63.57	0.28	0.463457
2251- UP	0.074443	47	7.74	0.58	4.27	0.32	3678.98	273.87	1208.87	89.99	0.24	0.660342
TOTAL				1.83		1.36		960.49754835			1.12	

RATIO R_HAT = 0.00191
POP. # CUST.: 26347 POP. ENERGY : 26651544
POP. CPKW : 50828 POP. KW/CUST.: 1.93

ESTIMATES FOR 90% C.I., 10% RELATIVE ACCURACY
MEAN PER UNIT SAMPLE SIZE ESTIMATE = 148.24
RATIO METHOD SAMPLE SIZE ESTIMATE = 91.16

07/2001 PEAK

			]----------CPKW DATA----------]				]----------KWH DATA----------]					
STRATUM	WEIGHT	S.S.	AVERAGE	WGT AVG	STD DEV	WGT STD	AVERAGE	WGT AVG	STD DEV	WGT STD	(F)	CORR.
0- 650	0.574293	112	1.12	0.64	1.79	1.03	446.52	256.43	518.32	297.67	0.56	0.847463
651-1350	0.206891	92	2.98	0.62	2.22	0.46	1282.52	265.34	645.20	133.49	0.38	0.586536
1351-2250	0.144373	79	5.29	0.76	3.62	0.52	2009.25	290.08	960.26	138.64	0.34	0.762900
2251- UP	0.074443	47	6.48	0.48	3.71	0.28	2726.32	202.96	1113.99	82.93	0.19	0.725917
TOTAL				2.51		2.29		1014.8115684			1.47	

RATIO R_HAT = 0.00247
POP. # CUST.: 26663 POP. ENERGY : 24352696
POP. CPKW : 60134 POP. KW/CUST.: 2.26

ESTIMATES FOR 90% C.I., 10% RELATIVE ACCURACY
MEAN PER UNIT SAMPLE SIZE ESTIMATE = 225.03
RATIO METHOD SAMPLE SIZE ESTIMATE = 115.14

GENERAL SERVICE - DEMAND RATE CLASS

Since the 2001 sample design provided very accurate load research results, no change is being proposed for the 2001 sample design. The stratification variable will be January kW billing demand with break points at 20 kW, 50 kW and 130 kW. The total number of sample points is proposed to be 160 sample points, which is the same sample size as the 2001 study.

The Neyman allocation of sample to strata for the new study is as follows:

	WINTER		
STR	WSTD CPKW	MIN n	INSTALLED n
1	1.22	6	31
2	3.47	17	35
3	5.18	25	52
4	4.20	20	42
	14.07	68	160

Additional statistical data and study design calculations for this rate class are provided in Table 8.

Table 8

RATES GSD and GSDT
STRATIFIED ON January 2001 KW (NCP)

01/2001 PEAK

			]==========CPKW DATA==========]				]==========KWH DATA==========]					
STRATUM	WEIGHT	S.S.	AVERAGE	WGT AVG	STD DEV	WGT STD	AVERAGE	WGT AVG	STD DEV	WGT STD	(F)	CORR.
0 - 20	0.343954	21	3.85	1.33	3.55	1.22	3047.81	1048.31	2305.01	792.82	0.67	0.846042
20.1- 50	0.414785	35	11.14	4.62	8.37	3.47	7324.43	3038.06	4452.28	1846.74	2.83	0.607654
50.1-130	0.185623	29	37.20	6.91	27.90	5.18	24587.59	4564.02	10910.07	2025.16	3.49	0.759934
130.1-UP	0.055638	33	92.65	5.15	75.56	4.20	61456.30	3419.31	37254.72	2072.78	2.82	0.741499
TOTAL				18.01		14.07		12069.696684			9.81	

RATIO R_HAT = 0.00149
POP. # CUST.: 14220 POP. ENERGY : 186766833
POP. CPKW :278651 POP. KW/CUST.: 19.60

ESTIMATES FOR 90% C.I., 10% RELATIVE ACCURACY
MEAN PER UNIT SAMPLE SIZE ESTIMATE = 165.28
RATIO METHOD SAMPLE SIZE ESTIMATE = 67.79

07/2001 PEAK

			]==========CPKW DATA==========]				]==========KWH DATA==========]					
STRATUM	WEIGHT	S.S.	AVERAGE	WGT AVG	STD DEV	WGT STD	AVERAGE	WGT AVG	STD DEV	WGT STD	(F)	CORR.
0 - 20	0.343954	26	10.61	3.65	7.39	2.54	5331.35	1833.74	3099.72	1066.16	1.48	0.813201
20.1- 50	0.414785	41	19.95	8.28	12.11	5.02	10512.54	4360.44	6497.13	2694.91	3.13	0.815125
50.1-130	0.185623	31	59.67	11.08	46.34	8.60	29942.19	5557.96	21421.39	3976.30	4.36	0.862641
130.1-UP	0.055638	35	137.96	7.68	97.69	5.44	71946.34	4002.95	49549.60	2756.84	2.38	0.903176
TOTAL				30.68		21.60		15755.090739			11.35	

RATIO R_HAT = 0.00195
POP. # CUST.: 14542 POP. ENERGY : 232301031
POP. CPKW :452344 POP. KW/CUST.: 31.11

ESTIMATES FOR 90% C.I., 10% RELATIVE ACCURACY
MEAN PER UNIT SAMPLE SIZE ESTIMATE = 134.16
RATIO METHOD SAMPLE SIZE ESTIMATE = 36.03

LARGE POWER RATE CLASS

The 2001 study design provided a very accurate estimate of demand for this class. The 2003 sample design will retain the 2001 sample design which is two strata with census metering of all LP rate customers whose billing demand during January was 800 kW or higher and a random sampling of 30 customers of the remaining customers.

LARGE POWER TOU RATE CLASS

The 2001 study design provided a very accurate estimate of demand for this class. The 2003 sample design will retain the 2001 sample design which is two strata with census metering of all LPT rate customers whose billing demand during January was 1,000 kW or higher and a random sampling of 20 customers of the remaining customers.

RTP,CISR/CSA, SBS RATES

All customers being billed on these two rate classes have a recorder installed, thus no sample design is necessary. The number of customers on these rate classes as of June 2002 are as follows:

RTP Rate - 7 customers

CISR/CSA Rate - 2 customers

SBS Rate - 2 customers

Table 9
GULF POWER COMPANY
2003 Cost of Service Load Research Rule Sample Size

Rate	Strata Allocation		Sample Size	
RS	1) MF-GT1000		21	
	2) MF-LE1000		20	
	3) MOBILE		30	
	4) SF-1451*2500		52	
	5) SF-GE2501		53	
	6) SF-LE1450		50	
		TOTAL	225	
GS	1) 0- 650		107	
	2) 651-1350		95	
	3) 1351-2250		89	
	4) 2251- UP		89	
		TOTAL	380	
GSD	1) 0 - 20		31	
	2) 20.1- 50		35	
	3) 50.1-130		52	
	4) 130.1- UP		42	
		TOTAL	160	
LP	1) 0 LT 800		30	
	2) 800- UP		24	(census)
		TOTAL	54	
LPT	1) Less than 1000 kW		20	
	2) 1000 kW and greater		29	(census)
		TOTAL	49	
RTP	1) All customers		7	(census)
CISR/CSA	1) All customers		2	(census)
SBS	1) All customers		2	(census)
		TOTAL	879	