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May 2, 2017

Via Electronic Filing Clerk
Florida Public Service Commission
2540 Shumard Oak Blvd.
Tallahassee, FL 32399-0850

RE: FPL 2017 Load Research Sampling Plan Filing

Dear Ms. Stauffer:

In compliance with FPSC Rule 25-6.0437, enclosed is FPL's 2017 Load Research Sampling Plan for approval of sample deployments for the years 2017 to 2019.

If you have any questions or require additional information about this filing, please call Tara Bachkosky at (561) 691-2391 or me at (561) 691-2421.

Sincerely,

/s/ Steve Romig
Steve Romig
Director, Rates and Tariffs

CC: Patti Daniel, Chief, Division of Economics (via electronic mail)

FLORIDA POWER & LIGHT COMPANY

Load Research Sampling Plan
FPSC Rule 25-6.0437

May 2, 2017

Rates and Tariff Administration Department
Load Research Section

FLORIDA POWER & LIGHT COMPANY

2017 Load Research Sampling Plan

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I. INTRODUCTION

Florida Power & Light Company (FPL) filed its last Load Research Sampling Plan on May 2, 2014. The Commission Staff approved the 2014 Plan on May 12, 2014. This 2017 Load Research Sampling Plan is being submitted by FPL in compliance with Rule 25-6.0437, Florida Administrative Code (Rule). The Rule applicable to electric utilities that provide electric service to more than 50,000 retail customers at the end of any calendar year requires those utilities to sample all rate classes that account for more than 1 percent of a utility's annual retail sales. The Rule further provides that the sampling plan shall be designed to provide estimates of the averages of the 12 monthly coincident peaks for each class within plus or minus 10 percent at the 90 percent confidence level. The sampling plan shall also be designed to provide estimates of the summer and winter peak demands for each rate class within plus or minus 10 percent at the 90 percent confidence level, except for the General Service Non-Demand rate class. The sampling plan shall be designed to provide estimates of the summer and winter peak demands for the General Service Non-Demand rate class within plus or minus 15 percent at the 90 percent confidence level. The Rule also requires the filing of a revised sampling plan to the Commission no less often than every three years after the most recent sampling plan was required to be submitted.

This report summarizes FPLs' proposed 2017 sample plan designs for the following rate classes:

- RS(T)-1:** Residential Service (RS-1 & RTR-1)
- GSD(T)-1:** General Service Demand (GSD-1, GSDT-1, HLFT-1, SDTR-1A & SDTR-1B)
- GS(T)-1:** General Service Non-Demand (GS-1 & GST-1)
- GSLD(T)-1:** General Service Large Demand (GSLD-1, GSLDT-1, CS-1, CST-1, HLFT-2, SDTR-2A & SDTR-2B)

As shown on Table 1, all other rate classes meeting the "more than 1%" of annual retail sales criterion are 100% metered with recording meters for billing purposes and therefore do not require statistical sampling.

Consistent with FPL's 2014 approved sampling plan, for purposes of this plan the related time-of-use (TOU), non-time-of-use rate classes and other related rate schedules were combined. For example, GSD-1 (General Service Demand), GSDT-1 (General Service Demand TOU), HLFT-1 (High Load Factor TOU) and SDTR-1 (Seasonal Demand TOU A & B) rate schedules are treated as one class [GSD(T)-1].

II. PROPOSED SAMPLING PLAN DESIGN METHODOLOGY

The sampling plan methodology proposed in this plan utilizes a three-year replacement cycle for the load research sampling points in the RS(T)-1, GSD(T)-1, GS(T)-1 and GSLD(T)-1 rate class samples.

The proposed sampling plan was developed using FPL's most currently available load research data and seasonal peak information. To ensure that a sufficient number of sample points would be selected, sample sizes were calculated for every month starting January 2014 through December 2016. The month with the largest number of required sample points over this period

was selected for each rate class.

Based on the results obtained from this data FPL proposes to continue the use of the following types of sample designs:

A one-dimensional stratified random design based on the annual average monthly energy for the RS(T)-1, GSD(T)-1, GS(T)-1, and GSLD(T)-1 rate classes.

The sample sizes reported herein are designed to meet FPSC accuracy requirements based on the requisite confidence level and expected data loss factors, while simultaneously minimizing costs.

RS(T)-1 Residential Service (RS-1 & RTR-1)

A one dimensional stratified random sample design process was used for the RS(T)-1 rate class. The customer population was stratified on the basis of average monthly energy consumption (kWh) for 2016.

Stratum breakpoints were defined using the Dalenius-Hodges method. This process generated four strata based on energy consumption:

1. 0 to 702 kWh
2. 703 to 1,339 kWh
3. 1,340 to 2,314 kWh
4. 2,315 kWh and Above

GSD(T)-1 General Service Demand (GSD-1, GSdT-1, HLFT-1, SDTR-1A & SDTR-1B)

A one dimensional stratified random sample design process was used for the GSD(T)-1 rate class. The customer population was stratified on the basis of average monthly energy consumption (kWh) for 2016.

Stratum breakpoints were defined using the Dalenius-Hodges method. The process generated three strata based on energy consumption, which are as follows:

1. 0 to 16,640 kWh
2. 16,641 to 65,920 kWh
3. 65,921 kWh and Above

The GSD(T)-1 class stratum breakpoints and sample size will be recalculated using the most current available load research data prior to its 2019 load research sample deployment.

GS(T)-1 General Service Non-Demand (GS-1 & GST-1)

A one dimensional stratified random sample design process was used for the GS(T)-1 rate class. The customer population was stratified on the basis of average monthly energy consumption (kWh) for 2016.

Stratum breakpoints were defined using the Dalenius-Hodges method. This process generated four strata based on energy consumption:

1. 0 to 700 kWh
2. 701 to 1,800 kWh
3. 1,801 to 3,800 kWh
4. 3,801 kWh and Above

The GS(T)-1 class stratum breakpoints and sample size will be recalculated using the most current available load research data prior to its 2018 load research sample deployment.

GSLD(T)-1 General Service Large Demand (GSLD-1, GSLDT-1, CS-1, CST-1, HLFT-2, SDTR-2A & SDTR-2B)

A one dimensional stratified random sample design process was used for the GSLD(T)-1 rate class. The customer population was stratified on the basis of average monthly energy consumption (kWh) for 2016.

Stratum breakpoints were defined using the Dalenius-Hodges method. This process generated two strata based on energy consumption:

1. 0 to 297,700 kWh
2. 297,701 kWh and Above

The GSLD(T)-1 class stratum breakpoints and sample size will be recalculated using the most current available load research data prior to its 2019 load research sample deployment.

III. PROPOSED SAMPLING PLAN SUMMARY

The following table lists the expected number of sample points and deployment year for each rate class:

Rate Class	Sample Points	Deployment Year	Detailed Design Statistics
RS(T)-1	712	2017	See Table 2
GSD(T)-1	240	2019	See Table 3
GS(T)-1	587	2018	See Table 4
GSLD(T)-1	125	2019	See Table 5

Please refer to Table 6 for definitions of variables and indices and Table 7 for formulas used in the design and estimation of these samples.

Except for the RS(T)-1 sample deployment in 2017, the sample sizes shown above will be recalculated using the most current available load research data prior to their deployment.

TABLE 1

FPL Retail Sales Rate Class	2016 Annual Retail Billed Sales		Data Collection Process
	MWH	Percent	
RS(T)-1 Residential Service, RS-1 and RTR-1	58,655,448	50.44%	Sampling Plan
GSD(T)-1 General Service Demand, GSD-1, GSdT-1, HLFT-1, SDTR-1A and SDTR-1B	26,370,339	22.68%	Sampling Plan
GSLD(T)-1 General Service Large Demand 1, 500 to 1,999 kW, GSLD-1, GSLDT-1, CS-1, CST-1, HLFT-2, SDTR-2A and SDTR-2B	10,554,075	9.08%	Sampling Plan
GS(T)-1 General Service Non-Demand, GS-1 and GST-1	6,194,060	5.33%	Sampling Plan
CILC-1D Commercial/Industrial Load Control, Distribution	2,657,526	2.29%	100% Sampled
GSLD(T)-2 General Service Large Demand 1, 2,000 + kW, GSLD-2, GSLDT-2, CS-2, CST-2, HLFT-3, SDTR-3A and SDTR-3B	2,583,669	2.22%	100% Sampled
CILC-1T Commercial/Industrial Load Control, Transmission	1,384,405	1.19%	100% Sampled
All Other Rate Classes ¹	7,885,645	6.78%	Not Applicable
Total	116,285,1	100%	

¹. Each rate class in this category falls below the 1% of annual retail sales criterion. Thus, load research sampling plans are not required.

TABLE 2

PROPOSED RS(T) SAMPLE DESIGN

Rate Classes : RS-1 and RTR-1 (Rate Codes 44 and 145)
 Deployment Year : 2017
 Sample Design : One Dimensional Stratified Random Sample - Combined Ratio Estimation,
 Dalenius-Hodges Procedure, Neyman Allocation, With Finite Population Correction
 Design Precision(P) : 10%
 Design Confidence : 90% (1.645)
 Stratification Variable : Annual Monthly Mean Energy (kWh)

[1]	[2]	[3]	[4]	[4]x[5]	[3]x[4]	[4]x([3]^2)	[8]	[7]
Strata	Sample Size	SDRh	Wh	Nh	Wh(SDRh)	Wh(SDRh)^2	Neyman Alloc. of n with losses (nh)	Proposed Sample
1	135	1.267	0.33166	1,413,560	0.420	0.532	148.940	149
2	318	1.902	0.36819	1,569,275	0.700	1.332	248.216	249
3	237	2.743	0.23862	1,017,024	0.655	1.795	231.994	232
4	79	3.720	0.06154	262,271	0.229	0.852	81.136	82
Sum(S)	769		1.00000	4,262,130	2.004	4.511	710.286	712
Combined		2.343		[5]				

CALCULATIONS	
YBAR =	2.2582
$n = (SWh^*SDRh)^2 / ((P^*YBAR/Z)^2 + (SWh(SDRh)^2 / SNh))$	
=	213,086
$n(\text{with losses}) = n / 0.3 =$	710,286

DEFINITIONS:

[1] Strata Break Points (kWh)
 Strata 1 = 0 - 702
 Strata 2 = 703 - 1,339
 Strata 3 = 1,340 - 2,314
 Strata 4 = 2,315 and Above

[2] Number of valid sample points in LodeStar for the month of February 2016. (Refer to Note B)

[3] Standard deviation for the month of February 2016 coincident peak, per LodeStar. (Refer to Note B)

[4] Percent of customers per strata for the summer and winter peak months from FPL's Customer Information System. (Refer to Note C)

[5] Total number of customers for the month of February 2016 from FPL's Customer Information System. (Refer to Note B)

[6] $nh = Wh(SDRh) / SWh(SDRh)$

[7] Based on Neyman Allocation of n with losses. Minimum strata size = 30, via central limit theorem.

NOTES:

A) The most current load research data available was obtained from LodeStar (FPL's Load Research System) for the period January 2014 to December 2016.

B) The above calculations were performed for every month of 2014, 2015 and 2016. February 2016 load research data produced the largest sample size requirement and was therefore selected.

C) The strata break points and weights were defined on the basis of average monthly energy consumption (kWh) for 2016.

TABLE 3

PROPOSED GSD(T) SAMPLE DESIGN

Rate Classes : GSD-1, GSDT-1, HLFT-1 and SDTR-1 (Rate Codes 70, 72, 170, 270 and 370)
Installation Year : 2018
Sample Design : One Dimensional Stratified Random Sample - Combined Ratio Estimation, Dalenius-Hodges Procedure, Neyman Allocation, With Finite Population Correction
Design Precision(P) : 10%
Design Confidence : 90% (1.645)
Stratification Variable : Annual Monthly Mean Energy (kWh)

[1]	[2]	[3]	[4]	[4]x[5]	[3]x[4]	[4]x([3]^2)	[6]	[7]
Strata	Sample Size	SDRh	Wh	Nh	Wh(SDRh)	Wh(SDRh)^2	Neyman Alloc. of n with losses (nh)	Proposed Sample
1	133	8.460	0.68777	69,294	5.819	49.225	97.317	98
2	180	19.396	0.24545	24,730	4.761	92.340	79.626	80
3	80	55.388	0.06678	6,728	3.699	204.856	61.860	62
Sum(S)	393		1.00000	100,751	14.278	346.421	238.802	240
Combined		28.533		[5]				

CALCULATIONS	
YBAR =	27.7324
$n = (SWh \cdot SDRh)^2 / ((P \cdot YBAR / Z)^2 + (SWh(SDRh)^2 / SNh))$	
=	71.641
$n(\text{with losses}) = n / 0.3 =$	238.802

DEFINITIONS:

[1] Strata Break Points (kWh)
 Strata 1 = 0 - 16,640
 Strata 2 = 16,641- 65,920
 Strata 3 = 65,921 and Above

[2] Number of valid sample points in LodeStar for the month of January 2014.
 (Refer to Note B)

[3] Standard deviation for the month of January 2014 coincident peak, per LodeStar.
 (Refer to Note B)

[4] Percent of customers per strata for the summer and winter peak months from FPL's Customer Information System.
 (Refer to Note C)

[5] Total number of customers for the month of January 2014 from FPL's Customer Information System. (Refer to Note B)

[6] $nh = Wh(SDRh) / SWh(SDRh)$

[7] Based on Neyman Allocation of n with losses. Minimum strata size = 30, via central limit theorem.

NOTES:

A) The most current load research data available was obtained from LodeStar (FPL's Load Research System) for the period January 2014 to December 2016.

B) The above calculations were performed for every month of 2014, 2015 and 2016. January 2014 load research data produced the largest sample size requirement and was therefore selected.

C) The strata break points and weights were defined on the basis of average monthly energy consumption (kWh) for 2016.

TABLE 4

PROPOSED GS(T) SAMPLE DESIGN

Rate Classes : GS-1 and GST-1 (Rate Codes 68 and 69)
 Deployment Year : 2018
 Sample Design : One Dimensional Stratified Random Sample - Combined Ratio Estimation,
 Dalenius-Hodges Procedure, Neyman Allocation, With Finite Population Correction
 Design Precision(P) : 15%
 Design Confidence : 90% (1.645)
 Stratification Variable : Annual Monthly Mean Energy (kWh)

[1]	[2]	[3]	[4]	[4]x[5]	[3]x[4]	[4]x([3]^2)	[6]	[7]
Strata	Sample Size	SDRh	Wh	Nh	Wh(SDRh)	Wh(SDRh)^2	Neyman Alloc. of n with losses (nh)	Proposed Sample
1	102	1.228	0.48423	200,758	0.595	0.730	203,506	204
2	128	1.612	0.28855	119,633	0.465	0.750	159,192	160
3	84	2.700	0.16745	69,422	0.452	1.221	154,728	155
4	29	3.283	0.05977	24,782	0.196	0.644	67,161	68
Sum(S)	343		1.00000	414,595	1.708	3.345	584,587	587
Combined		2.015		[5]				

CALCULATIONS	
YBAR =	1.4142
n = (SWh*SDRh)^2/((P*YBAR/Z)^2+(SWh(SDRh)^2/SNh))	
=	175.376
n(with losses) = n / 0.3	584.587

DEFINITIONS:

- [1] Strata Break Points (kWh)
 Strata 1 = 0 - 700
 Strata 2 = 701 - 1,800
 Strata 3 = 1,801 - 3,800
 Strata 4 = 3,801 and Above
- [2] Number of valid sample points in LodeStar for the month of February 2015.
 (Refer to Note B)
- [3] Standard deviation for the month of February 2015 coincident peak, per LodeStar.
 (Refer to Note B)
- [4] Percent of customers per strata for the summer and winter peak months from FPL's Customer Information System.
 (Refer to Note C)
- [5] Total number of customers for the month of February 2015 from FPL's Customer Information System. (Refer to Note B)
- [6] $nh = Wh(SDRh)/SWh(SDRh)$
- [7] Based on Neyman Allocation of n with losses. Minimum strata size = 30, via central limit theorem.

NOTES:

- A) The most current load research data available was obtained from LodeStar (FPL's Load Research System) for the period January 2014 to December 2016.
- B) The above calculations were performed for every month of 2014, 2015 and 2016. February 2015 load research data produced the largest sample size requirement and was therefore selected.
- C) The strata break points and weights were defined on the basis of average monthly energy consumption (kWh) for 2016.

TABLE 5

PROPOSED GSLD(T)-1 SAMPLE DESIGN

Rate Classes : GSLD-1, GSLDT-1, CS-1, CST-1, HLFT-2 and SDTR-2 (Rate Codes 62, 64, 73, 74, 164, 264 and 364)
 Deployment Year : 2016
 Sample Design : One Dimensional Stratified Random Sample - Combined Ratio Estimation,
 Dalenius-Hodges Procedure, Neyman Allocation, With Finite Population Correction
 Design Precision(P) : 10%
 Design Confidence : 90% (1.645)
 Stratification Variable : Annual Monthly Mean Energy (kWh)

[1]	[2]	[3]	[4]	[4]x[5]	[3]x[4]	[4]x([3]^2)	[6]	[7]
Strata	Sample Size	SDRh	Wh	Nh	Wh(SDRh)	Wh(SDRh)^2	Neyman Alloc. of n with losses (nh)	Proposed Sample
1	144	142.134	0.60486	1,821	85.971	12219.387	71.054	72
2	80	161.651	0.39514	1,189	63.875	10325.473	52.792	53
Sum(S)	224		1.00000	3,010	149.846	22544.860	123.846	125
Combined		149.037		[5]				

CALCULATIONS	
YBAR =	401.8850
$n = (SWh \cdot SDRh)^2 / ((P \cdot YBAR / Z)^2 + (SWh(SDRh)^2 / SNh))$	
=	37.154
$n(\text{with losses}) = n / 0.3 =$	123.846

DEFINITIONS:

[1] Strata Break Points (kWh)
 Strata 1 = 0 - 297,700
 Strata 2 = 297,700 and Above

[2] Number of valid sample points in LodeStar for the month of February 2015.
 (Refer to Note B)

[3] Standard deviation for the month of February 2015 coincident peak, per LodeStar.
 (Refer to Note B)

[4] Percent of customers per strata for the summer and winter peak months from FPL's Customer Information System.
 (Refer to Note C)

[5] Total number of customers for the month of February 2015 from FPL's Customer Information System. (Refer to Note B)

[6] $nh = Wh(SDRh) / SWh(SDRh)$

[7] Based on Neyman Allocation of n with losses. Minimum strata size = 30, via central limit theorem.

NOTES:

A) The most current load research data available was obtained from LodeStar (FPL's Load Research System) for the period January 2014 to December 2016.

B) The above calculations were performed for every month of 2014, 2015 and 2016. February 2015 load research data produced the largest sample size requirement and was therefore selected.

C) The strata break points and weights were defined on the basis of average monthly energy consumption (kWh) for 2016.

TABLE 6

DEFINITIONS OF VARIABLES AND INDICES

$YBAR$	=	Existing sample mean coincident demand (kW)
$XBAR$	=	Existing sample mean energy (kWh)
R	=	Ratio of mean coincident demand to mean energy for the existing sample
h	=	Index for each strata within the sample
i	=	Index for each customer
Y_{hi}	=	Coincident demand for each customer “i” in stratum “h”
X_{hi}	=	Energy for each customer “i” in stratum “h”
n_{Ch}	=	Number of customers in the existing sample in stratum “h”
SDR_h	=	Standard deviation of the residuals in stratum “h”
W_h	=	Stratum “h” weight
P	=	Precision (0.10 for RS, GSD & GSLD and 0.15 for GS)
$Z_{\alpha/2}$	=	Two tailed normal variate (1.645 for 90% confidence)
n	=	Required new sample size
N_h	=	Stratum “h” population (customers)
n_h	=	Required new sample size for stratum “h”

TABLE 7
FORMULAS USED IN SAMPLE DESIGNS

I. Calculations using rate load research data (Refer to Table 6 for definitions):

$$YBAR = \sum_h W_h x \left[\frac{\sum_i Y_{hi}}{nc_h} \right] \quad XBAR = \sum_h W_h x \left[\frac{\sum_i X_{hi}}{nc_h} \right] \quad R = \frac{YBAR}{XBAR}$$

$$SDR_h = \sqrt{\frac{\sum_i (Y_{hi} - R x X_{hi})^2}{nc_h - 1}}$$

II. Sample size calculation (Refer to Table 6 for definitions):

$$n = \frac{\left[\sum_h (W_h x SDR_h) \right]^2}{\left[\frac{PxYBAR}{Z_{\alpha/2}} \right]^2 + \frac{\sum_h (W_h x SDR_h^2)}{\sum_h N_h}}$$

$$n_h = \left[\frac{W_h x SDR_h}{\sum_h W_h x SDR_h} \right] xn$$