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April 28, 2020

VIA: ELECTRONIC FILING

Mr. Adam J. Teitzman
Commission Clerk
Florida Public Service Commission
2540 Shumard Oak Boulevard
Tallahassee, FL 32399-0850

Re: Load Research Report - Tampa Electric Company

Dear Mr. Teitzman:

In compliance with Rule 25-6.0437, attached is Tampa Electric Company's Load Research Report.

Thank you for your assistance in connection with this matter.

Sincerely,



James D. Beasley

JDB/bmp
Attachment

cc: Paula K. Brown (w/o enc.)

**TAMPA ELECTRIC COMPANY
LOAD RESEARCH REPORT
APRIL 2020**

REPORTING PERIOD

The data summarized in this report was collected during calendar year 2019. The samples were selected in 2017 and 2018; the recording equipment was installed prior to December 31 of the year the sample was selected in most cases.

SAMPLING PLAN

The sampling plan was formulated and filed with this Commission in August 2017.

RESIDENTIAL CLASS SAMPLE

The residential samples were pre-stratified by housing type. The three housing type categories are single-family detached, multi-family, and mobile-home. This stratification is required because the load patterns for the three housing types are dissimilar, for example, the mobile home percentages vary between summer and winter. Because the sample is stratified by housing type and the inter-strata migration is insignificant, the stratum weights are varied on a month by month basis when estimating class demands. Thus, the estimated demands reflect the seasonal changes in the housing type mix. The sample points were allocated to the strata using Neyman allocation with stratum means and variances estimated from the previous sample results. A minimum sample size of 50 was used in the multi-family and mobile home categories. The resulting sample allocation is shown below.

RESIDENTIAL SERVICE SAMPLE SIZES

Stratum	Sample Size
Single Family Detached	175
Multi Family	50
Mobile Home	50
Total	275

GENERAL SERVICE NON-DEMAND CLASS SAMPLE

The stratification variable used for the General Service Non-Demand sample was the annual kilowatt-hour (“kWh”) consumption at the time of sample selection. The stratum boundary was set at 15,000 kWh of annual usage. The sample points were allocated to the strata using Neyman allocation with stratum variances estimated from previous sample results. The allocation is shown below.

GENERAL SERVICE NON-DEMAND SAMPLE SIZES

Stratum	Sample Size
0 – 14,999 kWh	257
15,000 kWh and beyond	243
Secondary Metered / Primary Served	0 ⁽¹⁾
Primary Metered / Secondary Served	5 ⁽¹⁾
Primary Metered / Primary Served	17 ⁽¹⁾
Primary Metered / Subtransmission Served	0 ⁽¹⁾
Total	522

(1) 100 percent sampled stratum; therefore size will vary depending upon the number of customers meeting criteria.

GENERAL SERVICE DEMAND CLASS SAMPLE

The stratification variable used for the General Service Demand sample was the highest billed demand in the twelve months prior to sample selection. For cost of service analysis, class demands are separated by voltage level. For secondary voltage customers, the stratum boundaries were 200 kW and 500 kW. All customers over 500 kW were included in a 100 percent sampled stratum. For any customers subsequently exceeding this threshold, recorders were installed on the meters and they were included in the sample as well. The sample points in the two sampled strata were allocated using Neyman allocation. The allocation is shown below and reflects totals in the 100 percent sampled strata as of December 2019.

GENERAL SERVICE DEMAND SAMPLE SIZES

Stratum	Sample Size
Secondary 0 – 199 kW	70
Secondary 200 – 499 kW	70
Secondary over 499 kW (100%)	717 ⁽¹⁾
Secondary Metered/Primary Served (100%)	0 ⁽¹⁾
Primary Metered/Secondary Served	42 ⁽¹⁾
Primary Metered/Primary Served	111 ⁽¹⁾
Primary Metered/Subtransmission Served	1 ⁽¹⁾
Subtransmission Metered/Primary Served	1 ⁽¹⁾
Subtransmission Metered/Subtransmission Served	4 ⁽¹⁾
Total	1,016

(1) 100 percent sampled stratum; therefore size will vary depending upon the number of customers meeting criteria.

INTERRUPTIBLE SERVICE CLASS SAMPLE

The Interruptible Service (IS) class has recorders installed on each customer. For cost of service analysis, the customers are divided by voltage level. In the event customers migrate out of the IS rate, the analysis population is changed accordingly. The population size was 28 as of December 2019.

LIGHTING SERVICE CLASS SAMPLE

The lighting sample consists of four circuits of 84 total lights with varying types of fixtures and wattage.

STUDY METHODOLOGY

Following sample design, the load research study consists of four phases: data collection, editing, storage and analysis. The methodology Tampa Electric used in the phases for this study is basically the same as it has used in the past.

DATA COLLECTION

Once sample sizes, stratum definitions, and sample allocations are determined, sample selection begins. Random numbers are assigned to each customer in the class; then, the list of customers is sorted in ascending order by the assigned random number. The first group of customers on the list is the prime sample, while the following group is used, if necessary, as a source of replacement customers. The replacement list is maintained in random order and used in order, as needed. For customers selected, the standard billing watt-hour meter is replaced with a pulse initiating meter. In addition, a recording device is installed to collect and retain pulse information in fifteen minute intervals. The recorded information is collected, usually on a monthly basis, and processed by the Meter Department through a translation system. The translation system produces transfer files which are uploaded and subsequently input into the Load Research System (LRS). As of 2019, customers that have an AMI meter (smart meter) at their location will not get their meter replaced, the AMI's fifteen minute watt hour energy is transferred to LRS from the Tampa Electric Meter Data Management System. Both meter types are being used until full deployment of the AMI meters throughout Tampa Electric's service territory.

DATA EDITING AND STORAGE

Data entered into LRS goes through a preliminary screening to determine its acceptability. Data that does not pass the validation criteria is examined by analysts to determine if any portion of the data is useable and if any editing is required. The data is flagged to indicate whether it is suitable for analysis purposes and is then stored permanently.

DATA ANALYSIS

The data that passes LRS's validation criteria is then processed through software modules capable of performing stratified or unstratified mean-per-unit, combined ratio or separate ratio analysis. The analyses are run on a calendar month basis and produce statistics at the class level and at the per customer level.

RESULTS

The following tables provide the class coincident and non-coincident demands and their related precision for the calendar year 2019. The precision values reported are calculated at the 90 percent confidence level.

The winter system coincident peak occurred on February 22, 2019 at 16:00 and the summer coincident peak occurred on June 25, 2019 at 17:00. The following table shows the date and time of the monthly coincident and non-coincident peaks.

2019
COINCIDENT AND NON-COINCIDENT PEAK DATES AND TIMES

Month	Coincident Peak	Non-Coincident Peaks				
		RS	GS	GSD	IS	LS
Jan	29-08:00	17-08:00	28-10:00	04-14:00	09-17:00	20-05:00
Feb	22-16:00	23-17:00	20-15:00	20-14:00	21-22:00	08-03:00
Mar	15-18:00	10-18:00	15-17:00	11-14:00	31-14:00	13-06:00
Apr	30-17:00	14-17:00	30-16:00	30-15:00	18-07:00	03-04:00
May	28-18:00	27-18:00	29-16:00	30-14:00	14-24:00	06-06:00
Jun	25-17:00	26-18:00	26-16:00	25-14:00	12-08:00	30-06:00
Jul	16-17:00	14-18:00	16-15:00	16-14:00	26-07:00	14-04:00
Aug	22-18:00	25-18:00	29-16:00	29-15:00	23-15:00	29-01:00
Sep	05-16:00	09-18:00	05-15:00	05-15:00	06-10:00	14-21:00
Oct	28-17:00	04-18:00	31-15:00	01-14:00	10-24:00	13-03:00
Nov	07-16:00	02-16:00	07-15:00	07-15:00	25-13:00	20-24:00
Dec	17-19:00	19-08:00	17-15:00	17-14:00	03-20:00	07-04:00

Coincident Peak Tables

- Peak (MW)
- Average kW per Customer
- Precision (%)
- Load Factors (%)

2019
MONTHLY COINCIDENT PEAKS (MW)

Month	RS	GS	GSD	IS	LS
Jan	1,728.7	137.9	928.6	77.4	9.6
Feb	1,393.2	187.6	1,168.6	130.8	-
Mar	1,483.6	163.7	1,057.3	121.1	-
Apr	1,762.5	202.8	1,179.2	160.8	-
May	2,211.8	206.8	1,181.8	133.8	-
Jun	2,320.6	245.9	1,337.2	116.1	-
Jul	2,248.7	222.5	1,263.3	103.9	-
Aug	2,031.2	212.9	1,262.4	161.6	-
Sep	2,150.8	245.7	1,367.7	121.4	-
Oct	1,913.8	208.2	1,266.7	82.4	-
Nov	1,562.0	207.8	1,216.7	104.6	-
Dec	1,363.5	118.3	1,053.9	103.4	48.1
12 CP Avg.*	1,847.5	196.7	1,190.3	118.7	4.8

* Based on 12-month average CP

**2019
COINCIDENT PEAK
AVERAGE KW PER CUSTOMER**

Month	RS	GS	GSD	IS	LS
Jan	2.54	1.99	59.88	2,763.57	41.89
Feb	2.05	2.70	75.14	4,671.74	0.00
Mar	2.18	2.35	67.71	4,325.07	0.00
Apr	2.58	2.91	75.03	5,743.11	0.00
May	3.23	2.96	75.64	4,778.34	0.00
Jun	3.39	3.51	85.96	4,146.65	0.00
Jul	3.28	3.18	80.72	3,711.98	0.00
Aug	2.96	3.05	80.27	5,772.38	0.00
Sep	3.13	3.52	86.39	4,336.00	0.00
Oct	2.78	2.99	79.80	2,941.43	0.00
Nov	2.27	2.98	76.59	3,734.08	0.00
Dec	1.97	1.69	66.55	3,692.13	209.17

**2019
COINCIDENT PEAK
PRECISION (%)**

Month	RS	GS	GSD	IS	LS
Jan	7.99	8.90	6.67	N/A	N/A
Feb	6.36	6.50	5.34	N/A	N/A
Mar	4.90	8.52	3.28	N/A	N/A
Apr	5.22	7.02	4.07	N/A	N/A
May	4.26	7.26	3.83	N/A	N/A
Jun	3.78	7.04	4.06	N/A	N/A
Jul	4.33	5.79	3.33	N/A	N/A
Aug	3.54	7.97	3.08	N/A	N/A
Sep	3.98	6.59	3.47	N/A	N/A
Oct	3.84	6.48	2.92	N/A	N/A
Nov	5.40	6.60	3.14	N/A	N/A
Dec	6.85	5.95	4.71	N/A	N/A
12 CP	4.87	6.99	3.92	N/A	N/A

**2019
COINCIDENT PEAK
LOAD FACTORS (%)**

Month	RS	GS	GSD	IS	LS
Jan	54	69	84	106	221
Feb	58	52	74	93	N/A
Mar	55	57	76	100	N/A
Apr	55	54	75	79	N/A
May	57	63	81	98	N/A
Jun	59	56	75	109	N/A
Jul	59	60	77	102	N/A
Aug	65	64	82	85	N/A
Sep	62	55	73	92	N/A
Oct	61	60	78	159	N/A
Nov	54	45	69	114	N/A
Dec	62	75	77	108	39
12 CP Avg.*	58	59	77	104	22
Annual**	47	47	67	73	42

* Based on 12-month average CP and annual energy

** Based on maximum annual CP and annual energy

Non-Coincident Peak Tables

- Peak (MW)
- Average kW per Customer
- Precision (%)
- Load Factors (%)

2019
MONTHLY NON-COINCIDENT PEAKS (MW)

Month	RS	GS	GSD	IS	LS
Jan	1,762.7	167.7	1,087.7	148.3	52.0
Feb	1,613.1	192.0	1,208.6	174.2	50.5
Mar	1,537.6	181.8	1,128.0	215.1	50.7
Apr	1,927.5	209.0	1,215.5	200.1	49.8
May	2,391.7	243.7	1,283.3	210.5	49.6
Jun	2,425.1	256.8	1,365.4	186.8	48.9
Jul	2,384.4	239.7	1,321.5	176.5	49.2
Aug	2,353.2	242.9	1,394.4	203.7	49.7
Sep	2,229.3	247.3	1,407.0	168.5	49.8
Oct	1,985.0	226.6	1,320.9	187.3	50.0
Nov	1,626.8	211.9	1,256.4	168.5	49.5
Dec	1,486.0	170.1	1,205.8	188.7	49.4
12 NCP avg.*	1,847.5	215.8	1,266.2	185.7	49.9

* Based on 12-month average NCP

2019
NON-COINCIDENT PEAK
AVERAGE KW PER CUSTOMER

Month	RS	GS	GSD	IS	LS
Jan	2.59	2.42	70.14	5,296.43	228.26
Feb	2.37	2.76	77.71	6,221.43	220.34
Mar	2.26	2.61	72.24	7,682.14	221.44
Apr	2.82	3.00	77.34	7,146.43	217.33
May	3.50	3.49	82.14	7,517.86	216.55
Jun	3.54	3.67	87.77	6,671.43	214.67
Jul	3.48	3.43	84.44	6,303.57	215.81
Aug	3.43	3.48	88.67	7,275.00	217.91
Sep	3.24	3.55	88.88	6,017.86	218.55
Oct	2.88	3.25	83.22	6,689.29	218.36
Nov	2.36	3.04	79.08	6,017.86	217.17
Dec	2.15	2.44	76.14	6,739.29	214.85

**2019
NON-COINCIDENT PEAK
PRECISION (%)**

Month	RS	GS	GSD	IS	LS
Jan	8.55	9.16	5.28	N/A	N/A
Feb	6.85	6.85	4.99	N/A	N/A
Mar	6.98	8.15	4.73	N/A	N/A
Apr	5.54	7.08	3.82	N/A	N/A
May	4.89	6.54	3.65	N/A	N/A
Jun	4.24	6.24	4.06	N/A	N/A
Jul	4.12	5.28	3.72	N/A	N/A
Aug	3.98	5.79	3.17	N/A	N/A
Sep	3.59	6.24	3.95	N/A	N/A
Oct	4.44	6.60	3.65	N/A	N/A
Nov	6.44	6.30	3.66	N/A	N/A
Dec	10.08	6.96	5.92	N/A	N/A

**2019
NON-COINCIDENT PEAK
LOAD FACTORS (%)**

Month	RS	GS	GSD	IS	LS
Jan	53	56	72	55	41
Feb	50	51	71	70	45
Mar	53	51	71	56	40
Apr	50	52	73	63	42
May	52	54	74	62	40
Jun	57	53	73	68	41
Jul	55	56	74	60	39
Aug	56	56	74	67	39
Sep	60	55	71	66	40
Oct	59	55	75	70	38
Nov	52	44	67	70	40
Dec	57	52	67	59	38
12 NCP Avg.*	55	53	72	64	40
Annual**	45	45	65	55	38

* Based on 12-month average NCP and annual energy

** Based on maximum annual NCP and annual energy

Customer Non-Coincident Tables

- Peak (MW)
- Average kW per Customer
- Precision (%)

2019
CUSTOMER NON-COINCIDENT PEAKS (MW)

Month	RS	GS	GSD	IS	LS
Jan	4,828.7	424.3	1,522.9	256.5	N/A
Feb	4,286.5	376.6	1,558.3	289.0	N/A
Mar	4,470.8	380.9	1,498.8	310.4	N/A
Apr	4,300.6	371.8	1,588.4	295.5	N/A
May	4,540.9	401.0	1,658.3	314.0	N/A
Jun	4,443.6	397.3	1,726.3	285.3	N/A
Jul	4,388.8	398.3	1,690.2	309.8	N/A
Aug	4,389.6	412.8	1,795.4	333.3	N/A
Sep	4,400.9	407.4	1,732.1	270.0	N/A
Oct	4,353.0	395.6	1,708.5	315.0	N/A
Nov	4,228.3	368.6	1,590.6	283.9	N/A
Dec	4,511.5	365.5	1,567.9	305.7	N/A

2019
CUSTOMER NON-COINCIDENT PEAK
AVERAGE KW PER CUSTOMER

Month	RS	GS	GSD	IS	LS
Jan	7.11	6.13	98.21	9,160.71	N/A
Feb	6.30	5.42	100.19	10,321.43	N/A
Mar	6.56	5.46	95.98	11,085.71	N/A
Apr	6.30	5.34	101.06	10,553.57	N/A
May	6.64	5.74	106.14	11,214.29	N/A
Jun	6.49	5.68	110.97	10,189.29	N/A
Jul	6.40	5.70	108.00	11,064.29	N/A
Aug	6.39	5.92	114.17	11,903.57	N/A
Sep	6.40	5.84	109.41	9,642.86	N/A
Oct	6.32	5.68	107.64	11,250.00	N/A
Nov	6.13	5.29	100.12	10,139.29	N/A
Dec	6.53	5.24	99.00	10,917.86	N/A

2019
CUSTOMER NON- COINCIDENT PEAK
PRECISION (%)

Month	RS	GS	GSD	IS	LS
Jan	3.82	8.10	5.62	N/A	N/A
Feb	4.17	7.16	4.46	N/A	N/A
Mar	4.11	6.85	4.87	N/A	N/A
Apr	3.56	6.41	4.86	N/A	N/A
May	3.36	6.14	4.40	N/A	N/A
Jun	3.60	5.53	4.58	N/A	N/A
Jul	3.01	5.35	4.19	N/A	N/A
Aug	3.18	7.33	4.79	N/A	N/A
Sep	3.36	7.16	4.75	N/A	N/A
Oct	3.26	6.72	4.43	N/A	N/A
Nov	4.44	5.98	4.58	N/A	N/A
Dec	4.26	6.73	5.73	N/A	N/A

Monthly Energy Tables

- Class Energy (MWH)
- Average kWh per Customer

**2019
CLASS TOTAL
MONTHLY ENERGY (MWH)**

Month	RS	GS	GSD	IS	LS
Jan	691,490	70,329	580,897	61,061	15,705
Feb	545,890	66,155	580,028	81,724	15,328
Mar	609,796	69,318	597,430	90,307	15,041
Apr	692,781	78,347	639,701	91,463	14,892
May	933,120	97,567	707,998	97,239	14,668
Jun	994,134	98,410	720,353	91,158	14,507
Jul	981,433	99,018	728,203	79,056	14,343
Aug	986,442	100,916	772,176	102,058	14,274
Sep	964,336	97,356	721,367	80,019	14,226
Oct	875,397	93,003	738,177	97,309	14,183
Nov	607,685	66,939	603,982	85,510	14,182
Dec	626,277	65,960	602,814	83,223	14,102
Total	9,508,781	1,003,318	7,993,126	1,040,127	175,450

Note: Totals may not add due to rounding.

2019
AVERAGE kWh PER CUSTOMER

Month	RS	GS	GSD	IS	LS
Jan	1,018	1,016	37,460	2,180,750	68,880
Feb	803	952	37,294	2,918,714	66,936
Mar	895	994	38,260	3,225,250	65,680
Apr	1,014	1,125	40,701	3,266,536	65,031
May	1,364	1,398	45,318	3,472,821	64,050
Jun	1,452	1,406	46,304	3,255,643	63,626
Jul	1,431	1,416	46,531	2,823,429	62,906
Aug	1,437	1,447	49,102	3,644,929	62,605
Sep	1,402	1,396	45,567	2,857,821	62,394
Oct	1,271	1,334	46,505	3,475,321	61,936
Nov	881	960	38,017	3,053,929	62,203
Dec	906	945	38,064	2,972,250	61,312