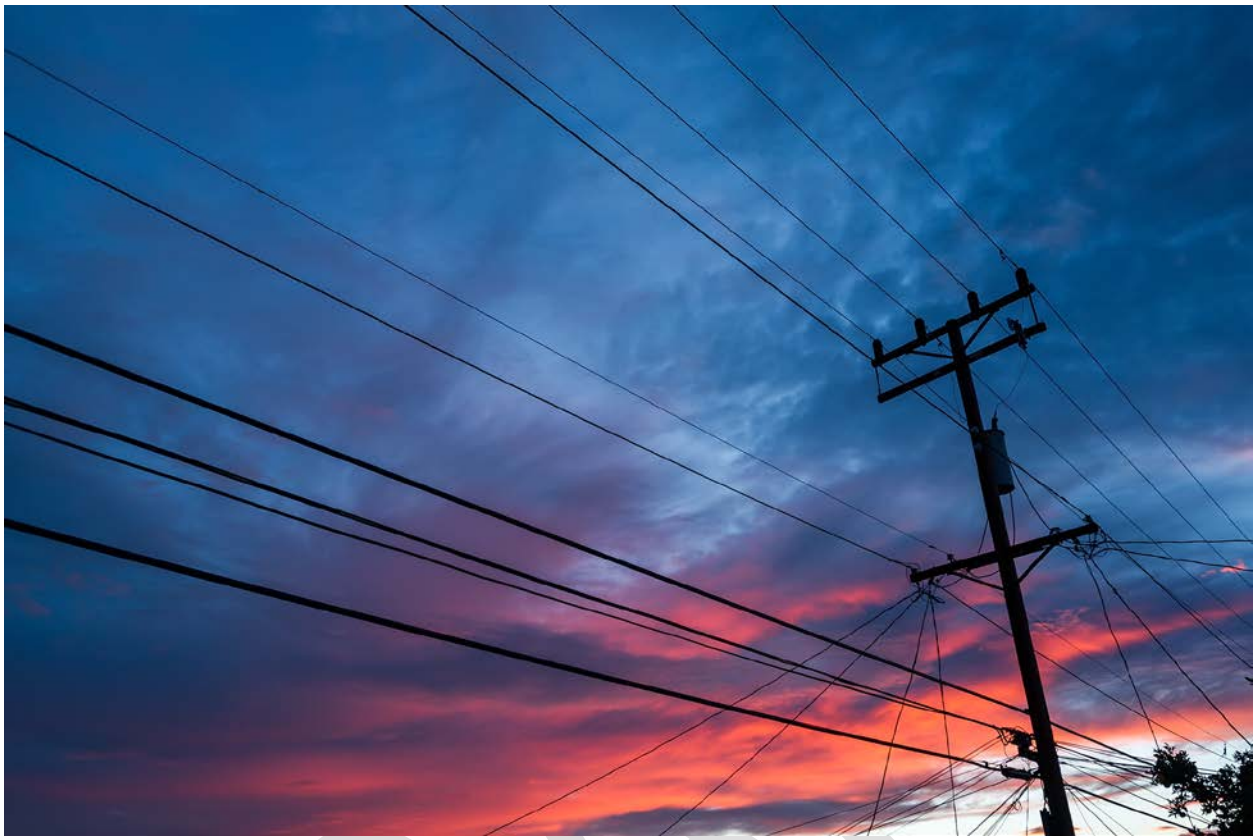

Review of Florida's Investor-Owned Electric Utilities

2017 Service Reliability Reports

November 2018

State of Florida
Florida Public Service Commission
Division of Engineering

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Terms and Acronyms

AMI	Advanced Metering Infrastructure
ANSI	American National Standards Institute
CAIDI	Customer Average Interruption Duration Index
CEMI5	Customers Experiencing More Than Five Interruptions
CI	Customer Interruption
CME	Customer Momentary Events
CMI	Customer Minutes of Interruption
DSM	Demand Side Management
DEF	Duke Energy Florida, LLC
EOC	Emergency Operation Center
F.A.C.	Florida Administrative Code
FEMA	Federal Emergency Management Agency
FPL	Florida Power & Light Company
FPUC	Florida Public Utilities Company
GIS	Geographic Information System
Gulf	Gulf Power Company
IEEE	Institute of Electrical and Electronics Engineers, Inc.
IOU	The Five Investor-Owned Electric Utilities: FPL, DEF, TECO, Gulf, and FPUC
L-Bar	Average of Customer Service Outage Events Lasting A Minute or Longer
MAIFIe	Momentary Average Interruption Event Frequency Index
N	Number of Outages
NWS	National Weather Service
OMS	Outage Management System
RDUP	Rural Development Utility Program
SCADA	Supervisory Control and Data Acquisition
SAIDI	System Average Interruption Duration Index
SAIFI	System Average Interruption Frequency Index
TECO	Tampa Electric Company
VMP	Vegetation Management Program

Reliability Metrics

Average Duration of Outage Events (L-Bar) is the sum of each outage event duration for all outage events during a given time period, divided by the number of outage events over the same time within a specific area of service.

Customer Average Interruption Duration Index (CAIDI) is an indicator of average interruption duration, or the time to restore service to interrupted customers. CAIDI is calculated by dividing the total system customer minutes of interruption by the number of customer interruptions. (CAIDI = CMI ÷ CI, also CAIDI = SAIDI ÷ SAIFI).

Customers Experiencing More Than Five Interruptions (CEMI5) is the number of retail customers that have experienced more than five service interruptions. (CEMI5 in this review is a customer count shown as a percentage of total customers.)

Customer Interruptions (CI) is the number of customer service interruptions, which lasted one minute or longer.

Customer Minutes of Interruption (CMI) is the number of minutes that a customer's electric service was interrupted for one minute or longer.

Customer Momentary Events (CME) is the number of customer momentary service interruptions, which lasted less than one minute measured at the primary circuit breaker in the substation.

Momentary Average Interruption Event Frequency Index (MAIFIe) is an indicator of average frequency of momentary interruptions or the number of times there is a loss of service of less than one minute. MAIFIe is calculated by dividing the number of momentary interruption events recorded on primary circuits by the number of customers served. (MAIFIe = CME ÷ C)

Number of Outage Events (N) measures the primary causes of outage events and identifies feeders with the most outage events.

System Average Interruption Duration Index (SAIDI) is a composite indicator of outage frequency and duration and is calculated by dividing the customer minutes of interruptions by the number of customers served on a system. (SAIDI = CMI ÷ C, also SAIDI = SAIFI x CAIDI)

System Average Interruption Frequency Index (SAIFI) is an indicator of average service interruption frequency experienced by customers on a system. It is calculated by dividing the number of customer interruptions by the number of customers served. (SAIFI = CI ÷ C, also SAIFI = SAIDI ÷ CAIDI)

Executive Summary

The Florida Public Service Commission (FPSC or Commission) has jurisdiction to monitor the reliability of electric service provided by Florida's investor-owned electric utilities (IOUs) for maintenance, operational, and emergency purposes.[1] This report is a compilation of the 2017 electric distribution reliability data filed by Florida's IOUs. The data is presented using tables and figures so that trends in each IOU's service reliability may be easily observed. In addition, the scope of the IOUs' Annual Distribution Service Reliability Report was expanded to include status reports on the various storm hardening and preparedness initiatives required by the Commission.[2] This data may be used during rate cases, show cause dockets, and is helpful in resolving customer complaints.

Monitoring service reliability is achieved through a review of service reliability metrics provided by the IOUs pursuant to Rule 25-6.0455, Florida Administrative Code (F.A.C.).[3] Service reliability metrics are intended to reflect changes over time in system average performance, regional performance, and sub-regional performance. For a given system, increases in the value of a given reliability metric denote declining reliability in the service provided. Comparison of the year-to-year levels of the reliability metrics may reveal changes in performance, which indicates the need for additional investigation, or work in one or more areas. Rule 25-6.0455, F.A.C., requires the IOUs to file distribution reliability reports to track adjusted performance that excludes events such as planned outages for maintenance, generation disturbances, transmission disturbances, wildfires, and extreme acts of nature such as tornados and hurricanes. This "adjusted" data provides an indication of the distribution system performance on a normal day-to-day basis.

With the active hurricane seasons of 2004 and 2005, the importance of collecting reliability data that would reflect the total reliability experience from the customer perspective became apparent. In June 2006, Rule 25-6.0455, F.A.C., was revised to require each IOU to provide both "actual" and "adjusted" performance data for the prior year. This data provides insight concerning the overall reliability performance of each utility.

The March 2018 Distribution Reliability Reports of Duke Energy Florida, LLC (DEF), Florida Power & Light Company (FPL), Florida Public Utilities Company (FPUC), Gulf Power Company (Gulf), and Tampa Electric Company (TECO) and responses to staff's data requests were sufficient to perform the 2017 review.

The following company specific summaries provide highlights of the observed patterns.

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[1] Sections 366.04(2)c and 366.05, Florida Statutes.

[2] Wooden Pole Inspection Orders: FPSC Order No. PSC-06-0144-PAA-EI, issued February 27, 2006, in Docket No. 20060078-EI; and FPSC Order Nos. PSC-06-0778-PAA-EU, issued September 18, 2006, PSC-07-0078-PAA-EU, issued January 29, 2007, in Docket No. 20060531-EU.
Storm Preparedness Initiative Orders: FPSC Order Nos. PSC-06-0351-PAA-EI, issued April 25, 2006, PSC-06-0781-PAA- EI, issued September 19, 2006, PSC-06-0947-PAA-EI, issued November 13, 2006, and PSC-07-0468-FOF-EI, issued May 30, 2007, in Docket No. 20060198-EI.

[3] The Commission does not have rules or statutory authority requiring municipal electric utilities and rural electric cooperative utilities to file service reliability metrics.

Service Reliability of Duke Energy Florida, LLC

DEF's 2017 unadjusted data indicated that allowable exclusions for outage events accounted for approximately 97 percent of all Customer Minutes of Interruption (CMI). The largest contributor to the exclusion percentage was the category of Named Storms at 96 percent. DEF experienced one tornado, Tropical Storm Emily, and Hurricane Irma.

On an adjusted basis, DEF's 2017 System Average Interruption Duration Index (SAIDI) was 83 minutes, decreasing its adjusted SAIDI by 2 minutes from the 2016 results. The trend for the SAIDI over the five-year period of 2013 to 2017 is trending slightly downward. The System Average Interruption Frequency Index (SAIFI) in 2017 was 0.92 interruptions, indicating a 6 percent decrease from 2016. The Customer Average Interruption Duration Index (CAIDI) increased for 2017 compared to 2016. Over the five-year period, the SAIFI is trending downward as the CAIDI is trending upward.

In **Figure 3-8**, DEF's Top Five Outage Categories, the category Defective Equipment is in the top spot representing 26 percent of the top 10-outage categories. The next two highest categories were Vegetation (20 percent) and All Other (20 percent). Other Weather (13 percent) and Animals (14 percent) are the next two causes of outages. Commission staff requested that, beginning with 2014 data, all IOU's use the same outage categories for comparison purposes. As such, the Vegetation, Defective Equipment, and Other Weather now include outage categories that in the past were separately identified. The Vegetation and Other Weather outage categories are trending downward for the five-year period of 2013 to 2017 even though the Other Weather category had a 8 percent increase in 2017 and the Vegetation category had a 2 percent decrease. The Defective Equipment had an increase between 2016 and 2017 and is trending upward for the same five-year period. The All Other category had an increase in 2017 when compared to 2016 and over the five-year period this category is trending upward. The Animals category had a decrease in 2017 and is relativity flat for the five-year period.

The percentage of reliability complaints compared to the total number of complaints filed with the Commission for DEF increased to 4.2 percent in 2017 from 4.0 percent in 2016. Over the five-year period from 2013-2017, DEF's reliability related complaints have been trending downward.

In 2017, DEF completed 985 hardening projects for existing transmission structures. The projects included maintenance pole change-outs, insulator replacements, Department of Transportation/customer relocations, line rebuilds, and system planning additions. The transmission structures are designed to withstand the current the National Electric Safety Code (NESC) wind requirements and are built utilizing steel or concrete structures. In 2018, DEF plans to harden 1,002 transmission structures. At the end of 2017, DEF reported 21,285 transmission structures left to harden.

Service Reliability of Florida Power & Light Company

In reviewing the unadjusted data for 2017, FPL's documented exclusions for outage events accounted for approximately 99 percent of all CMI. The biggest impact was the Named Storms accounting for approximately 98 percent of the CMI. The weather events that affected FPL's service area were 13 tornadoes, 2 fires events, Tropical Storm Emily, Tropical Storm Philippe, Hurricane Irma, and Hurricane Nate.

FPL's 2017 metrics on an adjusted basis include SAIDI which was reported as 54 minutes and represents a 2 minute decrease from last year's reported 56 minutes. The SAIFI and CAIDI both improved in 2017. The SAIFI decreased from 0.92 interruptions in 2016 to 0.90 interruptions in 2017 and the CAIDI decreased from 61 minutes in 2016 to 60 minutes in 2017.

Defective Equipment (38 percent) and Vegetation (18 percent) outages were the leading causes of the number of outage events per customer for 2017. Starting in 2014, Defective Equipment includes Equipment Failure, Equipment Connect and Dig-in, which were all separate categories, in prior years. The next three outage causes are Unknown (11 percent), Animals (10 percent) and Other (10 percent). **Figure 3-16** shows an increasing trend in the number of outage events attributed to Defective Equipment, which the number of outages increased by 8 percent from 2016 to 2017. The analysis shows a decreasing trend in the number of outage events caused by Vegetation, Unknown, and Animals. The number of outages decreased by 17 percent from 2016 to 2017 for Vegetation and increased for Unknown by 1 percent from 2016 to 2017. The analysis shows that the trend for the Animals category is trending downward and there was a decrease in outages of 6 percent and the Other category is relativity flat even though there was an increase in outages of 20 percent.

FPL's reliability related complaints percentage received by the Commission in 2017 was 0.7 percent, which is lower than the 0.8 percent received in 2016. FPL's reliability related complaints are trending upward as shown in **Figure 4-10**, even with the decrease in 2017.

In 2017, FPL replaced 1,934 wood transmission structures with spun concrete poles. FPL completed the replacement of ceramic post insulator with polymer insulators in 2014. Also, in 2014, FPL completed the installation of water-level monitoring systems and communication equipment in 223 substations. In 2018, FPL plans on replacing approximately 5,000 wood transmission structures. FPL has 5,991 wood transmission structures remaining to be replaced.

Service Reliability of Florida Public Utilities Company

The unadjusted data for FPUC indicates that its 2017 allowable exclusions accounted for approximately 93 percent of the total CMI. The Named Storms category accounted for approximately 84 percent of the CMI that were excluded. FPUC reported that neither the Northeast nor the Northwest divisions were impacted by tornados during 2017. The Northeast division was affected by Hurricane Irma. The Northwest division was impacted by Tropical Storm Cindy, Hurricane Harvey, and Hurricane Irma.

The 2017 adjusted data for FPUC's SAIDI was 139 minutes, which is a 25 percent decrease from the 185 minutes reported in the previous year. The SAIFI also decreased from 1.95 interruptions in 2016 to 1.64 interruptions in 2017. The CAIDI value in 2017 was 85 minutes, which is a decrease from the 95 minutes in 2016.

FPUC's top five causes of outages included Vegetation, Animals, Other Weather, Lightning, and Defective Equipment events. As shown in **Figure 3-21**, Vegetation (31 percent) was the number one cause of outages in 2017 followed by Animals (23 percent), Defective Equipment (14 percent), Other Weather (13 percent), and Lightning (7 percent). Vegetation, Animals, and Lightning attributed outages decreased in 2017, as Defective Equipment and Other Weather

(non-excludable weather events) caused outages increased. Beginning in 2014, the Defective Equipment category now includes outage categories that in the past were separately identified.

Reliability related complaints against FPUC are minimal. In 2017, the Utility had two reliability related complaints filed with the Commission. The volatility in FPUC's results can be attributed to its small customer base that averages 28,000 or fewer customers. For the last five years, the percentage of reliability related complaints against FPUC are trending upward.

All of the Northeast division's 138kV poles are constructed of concrete and steel. The Northeast division's 69kV transmission system consists of 217 poles of which 105 are concrete. The Northwest division does not have transmission structures. In 2017, FPUC did not harden any of its transmission structures. However, FPUC does plan to harden five structures in 2018. FPUC has 112 transmission structures left to be hardened.

Service Reliability of Gulf Power Company

Gulf's 2017 unadjusted data indicates that allowable exclusions accounted for approximately 28 percent of its CMI. Named Storms events accounted for 14 percent of the total CMI. Gulf explained Hurricanes Irma and Nate, and Tropical Storm Cindy affected its service area. In 2017, five tornadoes, which accounted for 4 percent of the total CMI, also affected its service area.

The 2017 SAIDI for Gulf was reported to be 116 minutes, which is higher than the 95 minutes reported in 2016. The SAIFI increased to 1.20 interruptions from 1.14 interruptions the previous year. The CAIDI increased to 97 minutes from 83 minutes in 2016. Gulf explained that it continues to collect outage data down to the customer meter level. The Utility reviews outage data and the resulting reliability indices at the system level and by its three districts. Gulf is analyzing 2017 data to determine the need for any specific improvement opportunities beyond the current programs and storm hardening initiatives.

Gulf's top five causes of outages were listed as Animals, Defective Equipment, Vegetation, Lightning, and Unknown. Animals (28 percent) caused outages was the number one cause of outages followed by Defective Equipment (23 percent), Vegetation (20 percent), Lightning (13 percent), and Unknown (7 percent). The number of outages decreased for two of the top five outage categories in 2017 when compared to 2016, which were outages due to Animals and Lightning as shown in **Figure 3-29**. The Defective Equipment and Vegetation categories now include outage categories that in the past were separately identified.

The percentage of complaints reported to the Commission against Gulf that were reliability related was 0.0 percent in 2017. This is lower than the 0.2 percent recorded last year. Gulf's percent of total complaints for the five-year period of 2013 to 2017 is trending downward. Overall, Gulf has the lowest percentage of total complaints that are reliability related as shown in **Figure 4-10**.

Gulf had two priority goals for hardening its transmission structures: installation of guys on H-frame structures and replacement of wooden cross arms with steel cross arms. The installation of guys on H-frame structures was completed in 2012. The replacement of wooden cross arms was due to be completed in 2017; however, Gulf experienced lengthy environmental permitting delays. In 2017, 54 wooden cross arms were replaced with 3 remaining to be replaced in 2018.

Service Reliability of Tampa Electric Company

TECO's 2017 unadjusted data indicate that the allowable exclusions for outage events accounted for approximately 77 percent of all the CMI. The largest documented exclusion was the Named Storms Events, which accounted for approximately 71 percent of the total excludable CMI. Hurricane Irma affected TECO's entire service area in 2017.

The adjusted SAIDI decreased from 83 minutes in 2016 to 73 minutes in 2017 and represents a 12 percent improvement in performance. The SAIFI increased to 1.03 interruptions from 1.01 interruptions in the previous year. The CAIDI decreased 14 percent from 83 minutes reported in 2016 to 71 minutes. TECO reported the improvements in SAIDI and CAIDI were attributed to less severe weather events combined with quicker restoration times. The increase in SAIFI was contributed to an increased number of outages experienced in 2017 as compared to 2016.

Defective Equipment (26 percent) and Vegetation (22 percent) were the largest contributors to TECO's causes of outage events followed by Animals (17 percent), Lightning (13 percent), and Unknown (10 percent). **Figure 3-37** illustrates the top five outage causes showing Defective Equipment related cause is trending upward. Defective Equipment had a 3.3 percent decrease in outages when compared to the previous year. Animal and Lightning related causes are trending downward. Vegetation and Unknown related causes are remaining relatively flat even though there were increases of 7.1 percent and 4.2 percent, respectively, in 2017. Beginning in 2014, the Defective Equipment category now includes outage categories that in the past were separately identified.

TECO's percentage of total complaints that are service reliability related decreased from 11.3 percent reported in 2016 to 8.0 percent in 2017. TECO's percentage of service reliability complaints is trending upward over the period of 2013 to 2017. TECO continues to focus on vegetation management, circuit review activity, line improvements, and other maintenance activities to minimize service-related complaints in 2018. Working through and responding to complaints at a regional level affords TECO an opportunity to be aware of any trends that may occur for a given feeder or lateral.

TECO's transmission system is hardened by utilizing its inspections and maintenance program to systematically replace wood structures with non-wood structures. In 2017, TECO hardened 407 structures including 389 pole replacements utilizing steel or concrete poles and replaced 18 sets of insulators with polymer insulators. TECO's goal for 2018 is to harden 58 transmission structures. TECO has approximately 7,262 wooden poles left to be replaced.

Review Outline

This review primarily relies on the March 2018 Reliability Reports filed by the IOUs for the 2017 reliability performance data and storm hardening and preparedness initiatives. A section addressing trends in reliability related complaints is also included. Staff's review consists of five sections.

- **Section I:** Storm hardening activities, which include each IOU's Eight-Year Wooden Pole Inspection Program and the Ten Storm Preparedness Initiatives.

- **Section II:** Each utility's actual 2017 distribution service reliability data and support for each of its adjustments to the actual service reliability data.

- **Section III:** Each utility's 2017 distribution service reliability based on adjusted service reliability data and staff's observations of overall service reliability performance.

- **Section IV:** Inter-utility comparisons and the volume of reliability related customer complaints for 2013 to 2017.

- **Section V:** Appendices containing detailed utility specific data of the IOUs and summaries of the municipal and rural cooperative utilities.

Section I: Storm Hardening Activities

Each IOU, pursuant to Rule 25-6.0342(2), F.A.C., must file a storm hardening plan which is required to be updated every three years. The IOU's third updated storm hardening plans were filed on May 2 and 3, 2016, except for FPL who filed its plan on March 15, 2016.[4] The following subsections provide a summary of each IOU's programs addressing an on-going Eight-Year Wooden Pole Inspection Program and the Ten Storm Preparedness Initiatives as directed by the Commission.

Eight-Year Wooden Pole Inspection Program

FPSC Order Nos. PSC-06-0144-PAA-EI, issued February 27, 2006, in Docket No. 20060078-EI and PSC-07-0078-PAA-EU, issued January 29, 2007, in Docket No. 20060531-EU, require each IOU to inspect 100 percent of their installed wooden poles within an eight-year inspection cycle. The National Electric Safety Code (NESC) serves as a basis for the design of replacement poles for wood poles failing inspection. Additionally, Rule 25-6.0342(3)(b), F.A.C., requires that each utility's storm hardening plan address the extent to which the plan adopts extreme wind loading standards as specified in Figure 250-2(d) of the 2007 edition of the NESC. Staff notes that DEF determined the extreme wind loading requirements, as specified in Figure 250-2(d) of the NESC did not apply to poles less than 60 feet in height that are typically found within the electrical distribution system. DEF stated in its 2009 Storm Hardening Report that extreme wind loading requirements have not been adopted for all new distribution construction since poles less than 60 feet in height are more likely to be damaged by falling trees, flying limbs, and other wind borne debris.[5]

[4] Docket Nos. 20160061-EI (FPL), 160105-EI (TECO), 20160106-EI (FPUC), 20160107-EI (DEF), and 20160108-EI (Gulf), *In re: Petition for approval of 2016-2018 storm hardening plan, pursuant to Rule 25-6.0342, F.A.C.*

[5] DEF Storm Hardening Plan 2007-2009, Appendix J, pp. 4-5.

Table 1-1 shows a summary of the quantities of wooden poles inspected by all IOUs in 2017.

Table 1-1.
2017 Wooden Pole Inspection Summary

Utility	Total Poles	Poles Planned 2017	Poles Inspected 2017	Poles Failed Inspection	% Failed Inspection	Years Complete in 8-Year Inspection Cycle
DEF	795,260	100,000	100,038	1,727	1.73%	3
FPL	1,075,419	133,630	123,279	6,225	5.05%	4
FPUC	26,548	3,439	4,105	205	4.99%	2
GULF	206,474	26,000	25,889	910	3.52%	4
TECO	285,000	0	0	0	0.00%	4

Source: The IOUs 2017 distribution service reliability reports.

Table 1-2 indicates the projected wooden pole inspection requirements for the IOUs.

Table 1-2.
Projected 2018 Wooden Pole Inspection Summary

Utility	Total Poles	Total Number of Wood Poles Inspected in current cycle	Number of Wood Pole Inspections Planned for 2018	Percent of Wood Poles Planned 2018	Percent of Wood Pole Inspections Completed in 8-Year Cycle	Years Remaining in 8-Year Cycle After 2016
DEF	795,260	395,296	100,000	12.57%	50%	5
FPL	1,075,419	511,387	124,915	11.62%	48%	4
FPUC	26,548	6,583	3,328	12.54%	25%	6
GULF	206,474	104,236	26,000	12.59%	50%	4
TECO	285,000	161,672	36,000	12.63%	57%	4

Source: The IOUs 2017 distribution service reliability reports.

The annual variances shown in Tables 1-1 and 1-2 are allowable so long as each utility achieves 100 percent inspection within an eight-year period. Staff continues to monitor each utility's performance.

Ten Initiatives for Storm Preparedness

On April 25, 2006, the Commission issued FPSC Order No. PSC-06-0351-PAA-EI, in Docket No. 20060198-EI. This Order required the IOUs to file plans for Ten Storm Preparedness Initiatives (Ten Initiatives).[6] Storm hardening activities and associated programs are on-going parts of the annual reliability reports required from each IOU since rule changes in 2006. The status of these initiatives is discussed in each IOU's report for 2017. Separate from the Ten Initiatives, and not included in this review, the Commission established rules addressing storm hardening of transmission and distribution facilities for all of Florida's electric utilities.[7,8,9]

Initiative 1 - Three-Year Vegetation Management Cycle for Distribution Circuits

Each IOU continues to maintain the commitment to complete three-year trim cycles for overhead feeder circuits, except for TECO, which is on a four-year cycle, since feeder circuits are the main arteries from the substations to the local communities. The approved plans of all the IOUs also require a maximum of a six-year trim cycle for lateral circuits. In addition to the planned trimming cycles, each IOU performs hot-spot tree trimming[10] and mid-cycle trimming to address rapid growth problems.

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[6] Docket No. 20060198-EI, Requirement for investor-owned electric utilities to file ongoing storm preparedness plans and implementation cost estimates.

[7] FPSC Order No. PSC-06-0556-NOR-EU, issued June 28, 2006, in Docket No. 20060172-EU, Proposed rules governing placement of new electric distribution facilities underground, and conversion of existing overhead distribution facilities to underground facilities, to address effects of extreme weather events, and Docket No. 20060173-EU, Proposed amendments to rules regarding overhead electric facilities to allow more stringent construction standards than required by National Electric Safety Code.

[8] FPSC Order Nos. PSC-07-0043-FOF-EU, issued January 16, 2007, and PSC-07-0043A-FOF-EU, issued January 17, 2007, both in Docket Nos. 20060173-EU and 20060172-EU.

[9] FPSC Order No. PSC-06-0969-FOF-EU, issued November 21, 2006, in Docket No. 20060512-EU, Proposed adoption of new Rule 25-6.0343, F.A.C., Standards of Construction - Municipal Electric Utilities and Rural Electric Cooperatives.

[10] Hot-spot tree trimming occurs when an unscheduled tree trimming crew is dispatched or other prompt tree trimming action is taken at one specific location along the circuit. For example, a fast growing tree requires hot-spot tree trimming in addition to the cyclical tree trimming activities. TECO defines hot-spot trimming as any internal or external customer driven request for tree trimming. Therefore, all tree trim requests outside of full circuit trimming activities are categorized as hot-spot trims.

Table 1-3 is a summary of feeder vegetation management activities by each company's cycle.

Table 1-3.
Vegetation Clearing from Feeder Circuits

IOU	# of Years in Cycle	1st Year of Cycle	Total Feeder Miles	Miles Trimmed				Total Miles Trimmed	% of Miles Trimmed
				1st Year	2nd Year	3rd Year	4th Year		
DEF	3	2015	4,106	1,024	1,016	2,106		4,146	101.0%
FPL	3	2016	12,850	4,418	4,381			8,799	68.5%
FPUC	3	2017	159	29				29	18.4%
GULF	3	2016	723	241	241			482	66.7%
TECO	4	2017	1,739	198.9				199	11.4%

Note: In 2012, the Commission approved TECO's request to modify its trim cycle for feeders to four years.[11]
Source: The IOUs 2017 distribution service reliability reports.

Based on the data in Table 1-3, it appears that both FPL and Gulf are on schedule with their feeder vegetation cycles. DEF has completed its three-year feeder trimming cycle with over 100 percent feeders trimmed. FPUC appears to be behind schedule for the three-year feeder trim cycle with 18.4 percent competed. FPUC suggests that its vegetation management would be more efficient if it trimmed all of the laterals associated with the feeders at the same time. This would allow FPUC to keep the trim crews in same general area instead of moving them to a different feeder or lateral. This vegetation management schedule has been started in several locations. TECO indicates that it is behind schedule with its vegetation management cycles due to recent storm activity and labor shortfalls. TECO explained that over the past two years, storms have impacted its service areas. Because of the storms, there has been a higher demand for qualified vegetation management personnel, which has far exceeded the supply.

[11] FPSC Order No. PSC-12-0303-PAA-EI, issued June 12, 2012, in Docket No. 20120038-EI, *In re: Petition to modify vegetation management plan by Tampa Electric Company*.

Table 1-4 is a summary of the lateral vegetation management activities by company.

Table 1-4.
Vegetation Clearing from Lateral Circuits

IOU	# of Years in Cycle	1st Year of Cycle	Total Lateral Miles	Miles Trimmed						Total Lateral Miles Trimmed	% of Lateral Miles Trimmed
				1st Year	2nd Year	3rd Year	4th Year	5th Year	6th Year		
DEF	5	2016	14,118	2,173	1,909					4,082	28.9%
FPL	6	2013	22,788	4,124	3,685	3,817	3,745	3,560		18,931	83.1%
FPUC	6	2014	571	145	134	188	86			554	97.0%
GULF	4	2014	5,148	1,294	913	331	446			2,984	58.0%
TECO	4	2017	4,524	627						627	13.9%

Note: In 2006, the Commission approved DEF's request to modify its lateral trim cycle to five years.[12] In the same docket, the Commission approved FPL's modified trim cycle for laterals to six years.[13] FPUC's lateral trim cycle was modified to six years in 2010.[14] The Commission approved Gulf's modified lateral trim cycle to four years in 2010.[15] In 2012, the Commission approved TECO's request to modify its trim cycle for laterals to four years.[16]

Source: The IOUs 2017 distribution service reliability reports.

From the data in Table 1-4, it appears that FPL and FPUC are on schedule with lateral vegetation cycles. DEF is in its second year of its five-year lateral trimming cycle with 28.7 percent laterals trimmed indicating that DEF is behind schedule. DEF plans to increase the number of lateral miles to be trimmed in 2018. Gulf reported that its goal is to trim one-fourth of its lateral lines each year. Gulf uses outage data to identify specific locations for trimming to improve reliability to its customers; therefore, the actual line miles trimmed may vary from year to year. Gulf has also invested in the removal of ground floor vegetation and herbicide programs that enhance the overall vegetation management program but may not be apparent in lateral mile tracking. As previously discussed, TECO is behind schedule with its vegetation management cycles due to the strong storm activity, which caused a higher demand for qualified vegetation management personnel.

[12] FPSC Order No. PSC-06-0947-PAA-EI, issued November 13, 2006, in Docket No. 20060198-EI, *In re: Requirement for investor-owned electric utilities to file ongoing storm preparedness plans and implementation cost estimates*.

[13] FPSC Order No. PSC-07-0468-FOF-EI, issued May 30, 2007, in Docket No. 20060198-EI, *In re: Requirement for investor-owned electric utilities to file ongoing storm preparedness plans and implementation cost estimates*.

[14] FPSC Order No. PSC-10-0687-PAA-EI, issued November 15, 2010, in Docket No. 20100264-EI, *In re: Review of 2010 Electric Infrastructure Storm Hardening Plan filed pursuant to Rule 25-6.0342, F.A.C., submitted by Florida Public Utilities Company*.

[15] FPSC Order No. PSC-10-0688-PAA-EI, issued November 15, 2010, in Docket No. 20100265-EI, *In re: Review of 2010 Electric Infrastructure Storm Hardening Plan filed pursuant to Rule 25-6.0342, F.A.C., submitted by Gulf Power Company*.

[16] FPSC Order No. PSC-12-0303-PAA-EI, issued June 12, 2012, in Docket No. 20120038-EI, *In re: Petition to modify vegetation management plan by Tampa Electric Company*.

Tables 1-3 and **1-4** do not reflect hot-spot trimming and mid-cycle trimming activities. An additional factor to consider is that not all miles of overhead distribution circuits require vegetation clearing. Factors such as hot-spot trimming and open areas contribute to the apparent variances from the approved plans. Annual variances as seen in Tables 1-3 and 1-4 are allowable as long as each utility achieves 100 percent completion within the cycle-period stated in its approved plan for feeder and lateral circuits.

Initiative 2 - Audit of Joint-Use Agreements

For hardening purposes, the benefits of fewer attachments are reflected in the extreme wind loading rating of the overall design of pole loading considerations. Each IOU monitors the impact of attachments by other parties to ensure the attachments conform to the utility's strength and loading requirements without compromising storm performance. Each IOU's plan for performing pole strength assessments includes the stress impacts of all pole attachments as an integral part of its eight-year wood pole inspection program. In addition, these assessments are also conducted on concrete and steel poles. The following are some 2017 highlights:

- DEF performs its joint-use audit on an eight-year cycle with 2017 being the third year in the current cycle. In 2017, DEF audited one-eighth of its joint-use attachments. Of the 57,605 distribution poles that were strength tested 145 failed the test. DEF added guy wires to 30 poles and replaced 113 of the failed poles. The two remaining poles will be addressed in 2018 because the final design solution has not been completed. However, potential solutions include installing larger, stronger poles or installing additional guying. DEF found no unauthorized attachments on the poles. Of its 5,761 joint-use transmission poles, 277 poles were strength tested with 52 poles failing the test. These transmission poles will be replaced.

- FPL audited approximately 20 percent of its service territory through its joint-use survey in order to determine the number and ownership of jointly used poles and associated attachments in 2017. Pole strength and loading tests were also performed on the joint-use poles. The results show that 13 (0.02 percent) poles failed the strength test due to overloading. The results also show that 2,166 (3.12 percent) poles failed the strength test due to other reasons, which could include pole decay or damage caused by woodpeckers. The 2017 survey and inspection results show that no unauthorized attachments were found.

- In 2014, FPUC added language to its Joint-Use agreements to clarify joint-use safety audit instructions. The additional language included a provision for an initial joint-use pole attachment audit to take place 12 months after the effective date of the agreement, and on a five-year recurring cycle after the first audit. Currently, four joint-use agreements have been executed. The other agreements are being negotiated. FPUC completed the joint-use pole attachment audit in 2016 and discovered discrepancies in the total number of attachments. However, it cannot identify which attachments were unauthorized due to insufficient initial data. The next audit should take place in 2021 which will provide more detail since FPUC will be able to refer to the 2016 audit as a benchmark.

- Gulf performs its joint-use inventory audits every five years. The last audit was completed in October 2016 and the next audit will be conducted in 2021. As of 2017, Gulf has 202,706 distribution poles with 312,149 third-party attachers (148,202 Telecom and 163,947 cable TV and other). Gulf is attached to 62,686 foreign poles. Gulf's mapping system has been updated to reflect the third-party attachments.

- In 2017, TECO conducted comprehensive loading analysis and continued to streamline its processes to better manage attachment requests from attaching entities. A comprehensive loading analysis was performed on 1,179 poles. TECO identified 8 distribution poles that were overloaded due to joint-use attachments and 35 poles were overloaded due to TECO's attachments. These overloaded poles were corrected by being re-guyed, re-configured, or reinforced with trusses.

Initiative 3 - Six-Year Transmission Inspections

The IOUs are required by the Commission to inspect all transmission structures and substations, and all hardware associated with these facilities. Approval of any alternative to a six-year cycle must be shown to be equivalent or better than a six-year cycle, in terms of cost and reliability in preparing for future storms. The approved plans for FPL, TECO, FPUC, and Gulf require full inspection of all transmission facilities within a six-year cycle. DEF, which already had a program indexed to a five-year cycle, continues with its five-year program. Such variances are allowed so long as each utility achieves 100 percent completion within a six-year period, as outlined in FPSC Order No. PSC-06-0781-PAA-EI, issued September 19, 2006, in Docket No. 20060198-EI.

- DEF inspected 822 transmission circuits (26 percent), 501 transmission substations (100 percent), 514 transmission tower structures (15 percent), and 12,699 transmission poles (25 percent) in 2017. DEF plans to inspect 32 percent of the transmission system in 2018. DEF performs ground patrol of transmission line structure associated hardware, and conductors on a routine basis to identify potential problems. DEF is on target for its five-year transmission inspections.

- In 2014, FPL began a new six-year cycle, performing climbing inspections on all 500 kV structures. Climbing inspections for all other steel and concrete structures are on a ten-year cycle. In 2017, FPL inspected approximately 83.8 percent of transmission circuits, 100 percent of transmission substations, 100 percent of non-wood transmission tower structures, and 22.5 percent of wood transmission poles. In addition, FPL inspects 100 percent of its wood poles and structures by performing a visual inspection at ground level each year. It appears that FPL is on target for its six-year transmission inspections.

- In 2016, FPUC inspected 100 percent of transmission circuits, transmission substations, tower structures, and transmission poles. The transmission inspections included climbing patrols of 95 138kV and 217 69kV structures. Transmission inspections will be conducted at a minimum every six years on all transmission facilities. FPUC is on schedule for its transmission facilities inspections.

- Gulf inspected 56 transmission substations in 2017 and conducted 428 inspections of its 2,467 metal poles and towers as well as 3,475 wood and concrete transmission poles. Gulf also performed four aerial inspections and inspected approximately 1,000 more poles than planned. The Utility replaced 123 of its wood transmission poles. Gulf's transmission line inspections include a ground line treatment inspection, a comprehensive walking inspection, and aerial inspections. The transmission inspections are based on two alternating 12-year cycles, which results in the structures being inspected at least once every six years. It appears that Gulf is on schedule for its transmission inspections.

- TECO's transmission system inspection program includes ground patrol, aerial infrared patrol, substation inspections, which are on a one-year cycle, above ground inspection and ground line inspection, which is on an eight-year cycle. The above ground inspection was shifted from a six-year cycle to an eight-year cycle in 2015 per FPSC Order No. PSC-14-0684-PAA-EI, issued December 10, 2014, in Docket No. 20140122-EI. Additionally, pre-climb inspections are performed prior to commencing work on any structure. In 2017, TECO inspected 72 (100 percent) of its transmission substations and completed 204 (100 percent) of its planned transmission equipment inspection. TECO did not complete any ground patrol or aerial infrared patrols because these inspections were completed in 2016. It appears that TECO is on target for its transmission inspection schedule.

Initiative 4 - Hardening of Existing Transmission Structures

Hardening transmission infrastructure for severe storms is important in order to continue providing transmission of electricity to high priority customers and key economic centers. IOUs are required by the Commission to show the extent of the utility's efforts in hardening of existing transmission structures. No specific activity was ordered other than developing a plan and reporting on storm hardening of existing transmission structures. In general, all of the IOU's plans continued pre-existing programs that focus on upgrading older wooden transmission poles. Highlights of 2017 and projected 2018 activities for each IOU are explained below.

- DEF planned 1,199 transmission structures for hardening and completed hardening of 985 transmission structures, which includes maintenance pole change-outs, insulator replacements, Department of Transportation/customer relocations, line rebuilds, and system planning additions. The transmission structures are designed to withstand the current NESC wind requirements and are built utilizing steel or concrete structures. In 2018, DEF plans to harden 1,002 transmission structures. DEF reported 53,476 transmission poles, with 21,285 wood poles (40 percent) left to be hardened.

- FPL completed all replacements of its ceramic post insulators with polymer insulators in 2014. Also, in 2014, FPL completed the installation of water-level monitoring systems and communication equipment in its 223 substations. FPL replaced 1,934 wood transmission structures with spun concrete poles in 2017. In 2017, FPL has 5,991 (9 percent) wood transmission structures remaining to be replaced.

- In 2017, FPUC did not harden any of its transmission structures. However, FPUC does plan to harden five structures in 2018. All of the Northeast division's 138kV poles are

constructed of concrete and steel and meet NESC standards. The Northeast division's 69kV transmission system consists of 217 poles of which 105 are concrete poles. FPUC has 112 (51 percent) transmission structures left to be hardened. This includes seven wood span guy poles. FPUC indicated that during the hardening replacements, it designed and installed self-supporting structures, which in most cases eliminates the need to use span guys. The Northwest division does not have transmission structures.

- Gulf has two priority goals for hardening its transmission structures: installation of guys on H-frame structures and replacement of wooden cross arms with steel cross arms. The installation of guys on H-frame structures was completed in 2012. In 2017, 54 transmission structures were hardened. The replacement of wooden cross arms with steel cross arms was due to be completed in 2017; however, Gulf experienced lengthy environmental permitting delays. Gulf has three wooden cross arms left to be replaced.

- TECO is hardening the existing transmission system by utilizing its inspections and maintenance program to systematically replace wood structures with non-wood structures. In 2017, TECO hardened 407 structures including 389 structure replacements utilizing steel or concrete poles and replaced 18 sets of insulators with polymer insulators. TECO's goal for 2018 is to harden 58 transmission structures. TECO has approximately 7,262 (30 percent) wood poles left to be replaced.

Initiative 5 - Transmission and Distribution Geographic Information System

Initiative 6 - Post-Storm Data Collection and Forensic Analysis

Initiative 7 - Collection of Detailed Outage Data Differentiating Between the Reliability Performance of Overhead and Underground Systems

These three initiatives are addressed together because effective implementation of any one initiative is dependent upon effective implementation of the other two initiatives. The five IOUs have GIS and other programs to collect post-storm data on competing technologies, perform forensic analysis, and assess the reliability of overhead and underground systems on an ongoing basis. Differentiating between overhead and underground reliability performance and costs is still difficult because underground facilities are typically connected to overhead facilities and the interconnected systems of the IOUs address reliability on an overall basis. The electric utility companies have implemented an Outage Management System (OMS). The collection of information for the OMS is being utilized in the form of a database for emergency preparedness. This will help utilities identify and restore outages sooner and more efficiently. The OMS also fills a need for systems and methods to facilitate the dispatching of maintenance crews during outages, and for providing an estimated time to restore power to customers. Effective restoration will also yield improved customer service and increased electric utility reliability. The year 2017 highlights and projected 2018 activities for each IOU are listed below:

- DEF's forensics teams will participate in DEF's 2018 Storm Drill. During field observations, the forensics team collects various information regarding poles damaged during storm events and collects sufficient data at failure sites to determine the nature and cause of the failure. In collaboration with University of Florida's Public Utility Research Center (PURC), DEF and the other IOUs developed a common format to collect and

track data related to damage discovered during forensics investigation. Weather stations were installed across Florida as part of the collaboration with PURC and the other IOUs. As a result, DEF is now able to correlate experienced outages with nearby wind speeds. This type of information is augmented with on-site forensics data following a major storm event. DEF collects information to determine the percentage of storm caused outages on overhead and underground systems.

DEF's GIS provides several sets of data and information points regarding DEF's assets. DEF uses OMS, Customer Service System, and GIS to help analyze the performance of its overhead and underground facilities. DEF collects available performance information as part of the storm restoration process. DEF implemented a new GIS, Work Management System, and Asset Management System in 2017. These systems allow DEF to facilitate the compliance tracking, maintenance, planning, and risk management of the major distribution and transmission assets. One hundred percent of the overhead and underground distribution and transmission systems are in the GIS. In addition, in 2017, DEF installed approximately 227 circuit miles of new underground cable. DEF indicated that its distribution system consists of 44 percent underground circuit miles.

- FPL completed its five approved Key Distribution GIS improvement initiatives in 2012. The initiatives include post-hurricane forensic analyses, the addition of poles, streetlights, joint-use survey, and hardening level data to the GIS. Data collection and updates to the GIS will continue through inspection cycles and other normal daily work activities. FPL has post-storm data collection and forensic analysis plans, systems and processes in place and ready for use. The plans, systems and processes capture overhead and underground storm performance based on an alternative metric of analyzing performance of laterals.

  FPL utilized its alternative plan to develop metrics to demonstrate the performance of, damage to, and causes of damage to overhead and underground facilities. This includes the population of overhead and underground feeders and laterals experiencing an outage vs. the respective total population of feeders and laterals, the performance of overhead hardened vs. non-hardened feeders, failure rates for overhead and underground transformers, failure rates for underground facilities by type, major causes of system damage, and overhead pole performance.

- FPUC uses GIS mapping for all of its deployed equipment and uses it to identify distribution and transmission facilities. The system interfaces with the Customer Information System to function as a Customer OMS. The implementation of the OMS has resulted in significant improvement in data collection and retrieval capability for analyzing and reporting reliability indices. The migration of the data began in 2012 and was completed in 2013. In 2014, FPUC began using the new OMS. The enhancements, which include providing outage data via smart mobile phones, have proven beneficial for managing outages. The plan to enable customer outage calls to be automatically logged into the system has been postponed to 2017 and 2018 due to the need to upgrade internal phone systems. FPUC purchased an application in 2015 that will enhance the current OMS by enabling crews to electronically receive and close outages in the field. The implementation of this application was completed in 2016. FPUC is exploring the

implementation of a contractor-hosted solution to avoid issues with incompatible phone systems to this application. Field data will be collected, analyzed, and entered into the OMS. The process is triggered 72 hours prior to a storm. FPUC collects outage data attributed to overhead and underground equipment failure in order to evaluate the associated reliability indices. During 2017, there were no projects to convert overhead facilities to underground on FPUC's system. In 2018, FPUC successfully implemented an OMS enhancement in which customers are able to leave a voice message containing further information that is beneficial for managing outages.

- Gulf completed its distribution facilities mapping transition to its new Distribution GIS in 2009. The transmission system has been completely captured in the transmission GIS database. The Distribution GIS and Transmission GIS are continually updated with any additions and changes as the associated work orders for maintenance, system improvements, and new business are completed. This ongoing process provides Gulf sufficient information to use with collected forensic data to assess performance of its overhead and underground systems in the event of a major storm. The forensic data collection process was tested prior to storm season. This process was activated as part of Gulf's pre-storm preparation for Hurricane Nate. Even though there was minimal damage to Gulf's facilities, Gulf and its contractors did test the transfer of data. Using aerial patrol, Gulf will be able to capture an initial assessment of the level of damage to the transmission system and record the GPS coordinates and failures with the Transmission Line Inspection System. Gulf's existing Common Transmission Database will be utilized to capture all forensic information. Gulf did experience outages and damage from transmission outages, planned outages, and all other outages in 2017, but these outage events did not produce major storm related data. Gulf will continue its record keeping and analysis of data associated with overhead and underground outages. Gulf collects data if underground cables are direct buried, and if they are, whether the cable is injected, or in a conduit, and whether the pole type is concrete or wood on outages as they occur.

- TECO's GIS continues to serve as the foundational database for all transmission, substation and distribution facilities. Development and improvement of the GIS continues on an ongoing basis. In 2017, over 35 changes and enhancements to the system were made including: data updates, and functionality changes to better conform to business processes and improve the user experience. TECO uses an outside contractor to execute the process that includes the establishment of a field asset database, forensic measurement protocol, integration of forensics activity with overall system restoration, forensics data sampling and reporting format. TECO incurs costs based on the category of storm and level of activation of the outside contractor depending upon the number of storm events in 2018. The data collected following a significant storm will be used to determine the root cause of damage. An established process is in place for collecting post-storm data, forensic analysis and outage performance data for both overhead and underground systems.

Initiative 8 - Increased Utility Coordination with Local Governments

The Commission's goal with this program is to promote an ongoing dialogue between IOUs and local governments on matters such as vegetation management and underground construction, in

addition to the general need to increase pre- and post-storm coordination. The increased coordination and communication is intended to promote IOU collection and analysis of more detailed information on the operational characteristics of underground and overhead systems. This additional data is also necessary to inform customers and communities that are considering converting existing overhead facilities to underground facilities (undergrounding), as well as to assess the most cost-effective storm hardening options.

Each IOU's external affairs representatives or designated liaisons are responsible for engaging in dialog with local governments on issues pertaining to undergrounding, vegetation management, public rights of way use, critical infrastructure projects, other storm-related topics, and day-to-day matters. Additionally, each IOU assigns staff to each county's EOC to participate in joint training exercises and actual storm restoration efforts. The IOUs now have outreach and educational programs addressing underground construction, tree placement, tree selection, and tree trimming practices.

- DEF's storm planning and response program is operational year-round to respond to catastrophic events at anytime. There are approximately 70 employees assigned full-time, year-round to coordinate with local governments on issues such as emergency planning, vegetation management, undergrounding, and service related issues. In 2017, DEF visited several EOCs in different counties to review storm procedures and participated in several different storm drills including Florida's state wide annual storm drill. For 2018, DEF plans to continue to participate in county storm drills and Florida's state wide annual storm drill. Also in 2017, DEF held 11 individual live line demonstration sessions across its service territory. These events addressed emergency response, general safety awareness, a utility's perspective on hurricane preparedness, and safety issues. Representatives from the sheriff's departments, public schools, and fire/rescue departments attended these sessions.

  When Hurricane Irma made landfall in Florida, DEF provided around the clock support for the State EOC and 35 county EOCs within its service territory. DEF executed its "Make It Safe" road-clearing program and modified it to provide support to counties well beyond 24-48 hours. In an effort to keep local governments and the public informed during the restoration process, DEF sent outbound customer messages, used social media sites, conducted print and broadcast interviews, participated in daily round table calls with the State, produced update videos, and distributed news releases.

- FPL, in 2017, continued efforts to improve local government coordination. The company conducted meetings with county emergency operations managers to discuss critical infrastructure locations in each jurisdiction. FPL also invited federal and state emergency management personnel to participate in FPL's annual storm preparedness drill. In 2017, FPL conducted over 1,000 community presentations providing information on storm readiness and other topics of community interest. FPL's dedicated government portal website has information that government leaders rely on to help during storm recovery. The site contains media alerts and releases, customer outage information and maps, critical infrastructure facility information, estimated time of restoration information, FPL staging site locations and available personnel resources. In addition, FPL meets with all

counties and municipalities that request information on line clearing and underground conversions. The meetings also include discussions on vegetation management and planting the "right tree in the right place."

- FPUC has continued its involvement with local governments regarding reliability issues with emphasis on vegetation management. FPUC's current practice is to have its personnel located at the county EOCs on a 24-hour basis during emergency situations to ensure good communication. FPUC also has a dedicated Manager of Government Relations in each division. The manager's role is to maintain relationships with local and state government officials and staff, and business and community leaders. The manager is also responsible for responding to customer issues referred by governmental officials.

- Gulf meets with governmental entities for all major projects, as appropriate, to discuss the scope of the projects and coordinate activities involved with project implementation. Gulf maintains year-round contact with city and county officials to ensure cooperation in planning, good communications, and coordination of activities. In 2017, Gulf participated in hurricane drills, EOC training, and statewide exercises. Gulf assigns employees to county EOCs throughout Northwest Florida to assist during emergencies. Gulf also conducts a storm drill each year. In 2017, Gulf's service area was not significantly affected by any named storms and received minimal damage from Hurricane Irma and Nate. However, Gulf did activate its mutual assistance plan and additional offsite crews responded during these events.

- TECO's communication efforts, in 2017, focused on maintaining existing vital governmental contacts and continued participation on standing disaster recovery planning committees. TECO participated in joint storm workshops, training involving governmental officials and exercises with Hillsborough, Polk, and Pinellas Counties and municipal agencies. TECO continues to work with local, state, and federal governments to streamline the flow of information to help efforts to restore all service as quickly as possible. Hurricane Irma triggered all county and municipal agencies to activate their EOCs. TECO had a representative in the EOCs for Oldsmar, Plant City, Tampa, Temple Terrace, Hillsborough County, Pasco County, Pinellas County, and Polk County.

Initiative 9 - Collaborative Research on Effects of Hurricane Winds and Storm Surge

PURC assisted Florida's electric utilities by coordinating a three-year research effort, from 2006 to 2009, in the area of hardening the electric infrastructure to better withstand and recover from hurricanes. Hurricane winds, undergrounding, and vegetation management research are key areas explored in these efforts by all of the research sponsors involved with PURC. Since that time, PURC compiles a research report every year to provide the utilities with results from its research. The latest report was issued February 2018.

Current projects in this effort include: (1) research on undergrounding existing electric distribution facilities by surveying the current literature including case analyses of Florida underground projects, and developing a model for projecting the benefits and costs of converting overhead facilities to underground; (2) data gathering and analysis of hurricane winds in Florida

and the possible expansion of a hurricane simulator that can be used to test hardening approaches; and (3) an initiative to increase public outreach to address storm preparedness in the wake of Hurricane Sandy. This included reaching out to affected states for further data and a print debate surrounding overhead vs. underground installation of power lines.

The effort is the result of FPSC Order No. PSC-06-0351-PAA-EI, issued April 25, 2006, in Docket No. 20060198-EI, directing each investor-owned electric utility to establish a plan that increases collaborative research to further the development of storm resilient electric utility infrastructure and technologies that reduce storm restoration costs and outages to customers. The order directed them to solicit participation from municipal electric utilities and rural electric cooperatives in addition to available educational and research organizations.

The IOUs joined with the municipal electric utilities and rural electric cooperatives in the state (collectively referred to as the Project Sponsors) to form a steering committee of representatives from each utility and entered into a Memorandum of Understanding (MOU) with PURC. In serving as the research coordinator for the project outlined by the MOU, PURC manages the workflow and communications, develops work plans, serves as a subject matter expert and conducts research, facilitates the hiring of experts, coordinates with research vendors, advise the project sponsors, and provides reports for project activities.

In 2017, PURC and the Steering Committee organized a web-based workshop for over 40 participants from the Project Sponsors. The workshop was held to orient new members on the model, described in the undergrounding section, of the costs and benefits of storm hardening strategies and to discuss the integration of data from recent storm activities. The model was described and the overall flow of the simulation element was discussed at the workshop. A test run of 50 hurricane years for the state and how the model illustrates the shift in the probability distribution of the outcome variables were demonstrated. In addition, the model's ability to simulate single hurricanes, both historical and hypothetical was run. Following the demonstration of the model, participants discussed strategies for adding data from recent storm experiences to the model. The utilities agreed to update the model with their data from the most recent storm (Hurricane Irma). Model input and output is utility specific. This effort should be completed in 2018.

Undergrounding Of Electric Utility Infrastructure: All five IOUs participate with PURC, along with the other cooperative and municipal electric utilities, in order to perform beneficial research regarding hurricane winds and storm surge within the state. The group's research shows that while underground systems on average have fewer outages than overhead systems, they can sometimes take longer to repair. Analyses of hurricane damage in Florida found that underground systems might be particularly susceptible to storm surge. The research on undergrounding has been the focus for understanding the economics and effects of hardening strategies, including undergrounding. As a result, Quanta Technologies was contracted to conduct a three-phase project to understand the economics and effect of hardening policies in order to make informed decisions regarding hardening of underground facilities.

Phase I of the project was a meta-analysis of existing research, reports, methodologies, and case studies. Phase II examined specific undergrounding project case studies in Florida and included an evaluation of relevant case studies from other hurricane prone states and other parts of the

world. Phase III developed a methodology to identify and evaluate the costs and benefits of undergrounding specific facilities in Florida. The primary focus is the impact of undergrounding on hurricane performance. This study also considered benefits and drawbacks of undergrounding during non-hurricane conditions. The collaborative refined the computer model developed by Quanta Technologies. The reports for Phase I, Phase II, and Phase III are available at http://warrington.ufl.edu/purc/research/energy.asp.

PURC and the utilities have worked to fill information gaps for model inputs; however, there are still information gaps to be filled. There have also been significant investments and efforts in the area of forensic data collection, which includes the utilities responses and plans to meet the FPSC's storm preparedness initiative. As discussed above, dialogues between the project sponsors and the PURC, regarding model updates, are in the process of being scheduled. These discussions are expected to include impacts associated with Hurricanes Hermine, Matthew, and Irma.

PURC has worked with doctoral and master's candidates at the University of Florida to assess the inter-relationships between wind speed and other environmental factors on utility damage. PURC was contacted by the University of Wisconsin and North Carolina State University, who showed interest in the model, but no additional relationships have been established. Researchers at the Argonne National Laboratory also contacted PURC. The researchers were interested in modeling the effects of storm damage and developed a deterministic model, rather than a probabilistic model, themselves. The researchers did use many of the factors that the collaborative attempted to quantify. The researchers that contacted PURC cite the model as the only non-proprietary model of its kind.

The PURC report noted that the research discussed in previous years' reports on the relationship between wind speed and rainfall is still under review. Further results of the relationship and related research can likely be used to supplemental and refine the model.

Hurricane Wind Effects: The collaborative group is trying to determine the appropriate level of hardening required for the electric utility infrastructure against wind damage from hurricanes. The project's focus was divided into two categories: (1) accurate characterization of severe dynamic wind loading; and (2) understanding the likely failure modes for different wind conditions. An agreement with WeatherFlow, Inc., to study the effects of dynamic wind conditions upon hurricane landfall includes 50 permanent wind-monitoring stations around the coast of Florida. This agreement expired in 2012; however, it was renewed in April 2017 and will automatically renew annually on the effective date for an additional one-year period, unless terminated by the parties to the agreement. In addition, PURC has developed a uniform forensics data gathering system for use by the utilities and a database that will allow for data sharing that will match the forensics data with the wind monitoring and other weather data.

Public Outreach: PURC researchers continue to discuss the collaborative effort in Florida with the engineering departments of the state regulators in Connecticut, New York, and New Jersey, Pennsylvania, and regulators in Jamaica, Grenada, Curacao, Samoa, and the Philippines. The regulators and policymakers showed interest in the collaborative effort and its results, but have shown no further interest in participating in the research effort. In addition, PURC

researchers also engaged with the popular media in preparation for, and in the wake of Hurricane Irma. This included 13 online articles, three radio broadcasts, and a TV broadcast.

Initiative 10 - A Natural Disaster Preparedness and Recovery Program

Each IOU is required to maintain a copy of its current formal disaster preparedness and recovery plan with the Commission. A formal disaster plan provides an effective means to document lessons learned, improve disaster recovery training, pre-storm staging activities and post-storm recovery, collect facility performance data, and improve forensic analysis. In addition, participation in the Commission's annual pre-storm preparedness briefing is required which focuses on the extent to which all Florida electric utilities are prepared for potential hurricane events. The following are some 2017 highlights for each IOU.

- DEF's Storm Recovery Plan is reviewed and updated annually based on lessons learned from the previous storm season and organizational needs. The Distribution System Storm Operational Plan and the Transmission Storm Plan incorporates organizational redesign at DEF, internal feedback, suggestions, and customer survey responses. DEF uses the Extreme Wind Loading standards in accordance with the National Electrical Safety Code, Rule 250C in all planning for transmission upgrades, rebuilds and expansions of existing facilities.

- FPL's Storm Emergency Plan identifies emergency conditions associated with natural disasters and responsibilities and duties of FPL's Emergency Response Organization. The plan provides a summary of overall emergency process, systems, accounting, safe work practices, etc. The plan also provides information on the Emergency Response Organization conducting damage assessment, restoration response, supporting organizations for external agency support, such as regulatory bodies, EOC's, local governments, etc., and support to major commercial and industrial customers. The plan is reviewed annually and revised as necessary.

- FPUC utilizes its Disaster Preparedness and Recovery Plan to prepare for storms annually and will ensure all employees are aware of their responsibilities. The objectives included in the plan to ensure orderly and efficient service restoration are: the safety of employees, contractors, and the general public; early damage assessment in order to develop manpower requirements; request additional manpower as soon as conditions and information indicate the need; provide for orderly restoration activities; provide all logistical needs for employees and contractors; provide ongoing preparation of FPUC's employee buildings, equipment and support functions; and provide support and additional resources for employees and their families. The plan was updated in 2017 and included: the organizational chart to reflect employee changes, telephone contact lists, and the transmission provider was changed from JEA to FPL.

- Gulf's 2018 Storm Restoration Procedures Manual is currently being revised and reviewed and all changes will be incorporated by April 1, 2018. Gulf continues to provide annual refresher training in the area of storm preparedness for various storm roles at minimal cost. A mock hurricane drill was completed on May 16, 2017. The drill involved testing the readiness to deal with an unexpected event during a restoration effort. Gulf uses the strategy described in its Storm Restoration Procedures Manual to respond to any

natural disaster that may occur. Annually, Gulf develops and refines its planning and preparations for the possibility of a natural disaster. Gulf's restoration procedures establish a plan of action to be utilized for the operation and restoration of generation, transmission, and distribution facilities during major disasters.

- TECO's Emergency Management Plans address all hazards, including extreme weather events. TECO continues to use the policy labeled Emergency Management and Business Continuity. This policy delineates the responsibility at employee, company, and community levels. TECO continues to participate in internal and external preparedness exercises, collaborating with government emergency management agencies, at local, State and Federal levels. Prior to June 1, 2017, all emergency support functions were reviewed, personnel trained, and Incident Command System Logistics and Planning Section Plans were tested. TECO continues to participate in internal and external preparedness exercises, and collaborates with local, state, and federal government emergency management agencies. During the state's mock hurricane exercise, TECO tested its response and communications plans.

Section II: Actual Distribution Service Reliability

Electric utility customers are affected by all outage and momentary events, regardless of where problems originate. For example, generation events and transmission events, while remote from the distribution system serving a customer, affect the distribution service experience. Actual reliability data is the accumulation of these events.

The actual reliability data includes two subsets of outage data: (1) data on excludable events; and (2) data pertaining to normal day-to-day activities. Rule 25-6.0455(4), F.A.C., explicitly lists outage events that may be excluded:

- ♦ Planned service interruptions.
- ♦ A storm named by the National Weather Service.
- ♦ A tornado recorded by the National Weather Service.
- ♦ Ice on lines.
- ♦ A planned load management event.
- ♦ Any electric generation or transmission event not governed by subsection Rule 25-6.018(2) and (3) F.A.C.
- ♦ An extreme weather or fire event causing activation of the county emergency operation center.

This section provides an overview of each IOU's actual 2017 performance data and focuses on the exclusions allowed by the rule.

Duke Energy Florida, LLC: Actual Data

Table 2-1 provides an overview of key DEF metrics: Customer Minutes of Interruption (CMI) and Customer Interruptions (CI) for 2017. Excludable outage events accounted for approximately 97 percent of the minutes of interruption experienced by DEF's customers. In 2017, DEF experienced a tornado that impacted its service area on January 22, 2017, Tropical Storm Emily on July 31, 2017, and Hurricane Irma on September 9-20, 2017.

The biggest impact on CMI were the Named Storm events, which accounted for approximately 96 percent of the excludable minutes of interruptions. DEF reported that the Transmission Events accounted for 0.40 percent of the excludable minutes of interruptions. DEF reported that the initiating causes varied from equipment failures to weather, but were predominantly weather causes. The sustained causes also varied from major storm weather to vegetation. DEF reported that there were 340 major transmission events resulting in exclusion in 2017.

Table 2-1.
DEF's 2017 Customer Minutes of Interruptions and Customer Interruptions

2017	Customer Minutes of Interruption (CMI)		Customer Interruptions (CI)	
	Value	% of Actual	Value	% of Actual
Reported Actual Data	**4,572,731,881**		**4,056,764**	
Documented Exclusions				
Planned Service Interruptions	19,532,821	0.43%	439,486	10.83%
Named Storms	4,381,736,056	95.82%	1,552,555	38.27%
Tornadoes	6,300,041	0.14%	25,021	0.62%
Ice on Lines		0.00%		0.00%
Planned Load Management Events		0.00%		0.00%
Generation/Transmission Events	18,148,483	0.40%	397,194	9.79%
Extreme Weather (EOC Activation/Fire)		0.00%		0.00%
Reported Adjusted Data	**147,014,480**	**3.22%**	**1,642,508**	**40.49%**

Source: DEF's 2017 distribution service reliability report.

Florida Power & Light Company: Actual Data

Table 2-2 provides an overview of FPL's CMI and CI figures for 2017. Excludable outage events accounted for approximately 99 percent of the minutes of interruption experienced by FPL's customers. FPL reported thirteen tornados, two fire events, Hurricane Irma, Hurricane Nate, Tropical Storm Emily, and Tropical Storm Philippe in 2017. FPL reports that even though Hurricane Nate did not make landfall in its service territory, seven of FPL's territories were impacted. Tropical Storm Emily impacted FPL's service territories on July 31, 2017 through August 1, 2017, Hurricane Irma on September 7-24, 2017, Hurricane Nate on October 8, 2017, and Tropical Storm Philippe on October 28-29, 2017. The two fire events impacted the Naples region on March 5-6, 2017, and April 22-23, 2017. The tornados affected the following regions:

- West Dade and West Palm regions on January 22-23, 2017
- North Florida region on February 7-8, 2017
- Toledo Blade region on March 13, 2017
- Toledo Blade and Wingate regions on March 14, 2017
- Treasure Coast region on March 23, 2017
- Naples and Treasure Coast regions on April 6, 2017
- Boca Raton region on May 2, 2017
- North Florida region on May 24, 2017
- Gulfstream region on June 5, 2017
- North Florida region on June 6, 2017
- Treasure Coast and Brevard regions on August 18, 2017
- Manasota region on August 26-27, 2017
- Gulfstream region on October 24, 2017

The biggest impact on CMI was the Named Storm events, which accounted for approximately 98 percent of the excludable minutes of interruption. FPL explained that after each extreme weather event, it gathers relevant information to critique its processes and performance. FPL continues to further develop new technology to strengthen its emergency response. Two examples of FPL's new technology are: (1) a mobile application which combines outage tickets, weather information, electrical network information, customer energy consumption and voltage, restoration crew locations and meter status; and (2) another new technology uses smart meter

information to confirm power status of all smart meters in an area before the restoration crews leave that area. These new technologies will assist with diagnosing problems accurately.

Table 2-2.
FPL's 2017 Customer Minutes of Interruptions and Customer Interruptions

2017	Customer Minutes of Interruption (CMI)		Customer Interruptions (CI)	
	Value	% of Actual	Value	% of Actual
Reported Actual Data (1)	**19,490,525,605**		**11,582,664**	
Documented Exclusions				
Planned Service Interruptions	24,053,437	0.12%	279,467	2.41%
Named Storms	19,172,871,947	98.37%	6580299	56.81%
Tornadoes	25,985,521	0.13%	269314	2.33%
Ice on Lines	0	0.00%	0	0.00%
Planned Load Management Events	0	0.00%	0	0.00%
Generation/Transmission Events (2)	10,302,765	0.05%	769,414	6.64%
Extreme Weather (EOC Activation/Fire)	1,052,790	0.01%	7,495	0.06%
Reported Adjusted Data	**266,561,910**	**1.37%**	**4,446,089**	**38.39%**

Notes: (1) Excludes Generation/Transmission Events per Rule 25-6.0455(2), .F.A.C.; and (2) Information Only, as reported actual data already excludes Generation/Transmission Events.
Source: FPL's 2017 distribution service reliability report.

Florida Public Utilities Company: Actual Data

Table 2-3 provides an overview of FPUC's CMI and CI figures for 2017. Excludable outage events accounted for approximately 93 percent of the minutes of interruption experienced by FPUC's customers. The biggest impact on CMI was the Named Storms events, which accounted for approximately 84 percent of the excludable minutes of interruption. FPUC reported that neither the Northeast nor the Northwest divisions were impacted by tornados during 2017. FPUC reported that the following weather events impacted its service area: Tropical Storm Cindy, on June 19-22, 2017, affected the Northwest division, Hurricane Harvey, on August 29-31, 2017, affected the Northwest division, and Hurricane Irma, on September 9-13, 2017, affected both divisions.

FPUC reported the Northeast division experienced a major transmission event on January 21, 2017, May 31, 2017, and July 10, 2017. The NE Division experienced a substation outage on December 12, 2017. The NW Division experienced one substation event on September 15, 2017. Both divisions had several planned outages that allowed FPUC to perform maintenance to different sections of the distribution system.

Table 2-3.
FPUC's 2017 Customer Minutes of Interruptions and Customer Interruptions

2017	Customer Minutes of Interruption (CMI)		Customer Interruptions (CI)	
	Value	% of Actual	Value	% of Actual
Reported Actual Data	**55,971,247**		**149,430**	
Documented Exclusions				
Planned Service Interruptions	182,313	0.33%	2,735	1.83%
Named Storms	47,228,463	84.38%	31,851	21.31%
Tornadoes	0	0.00%	0	0.00%
Ice on Lines	0	0.00%	0	0.00%
Planned Load Management Events	0	0.00%	0	0.00%
Generation/Transmission Events	2,345,212	4.19%	57,583	38.54%
Extreme Weather (EOC Activation/Fire)	2,182,893	3.90%	9,541	6.38%
Reported Adjusted Data	**4,032,366**	**7.20%**	**47,720**	**31.93%**

Source: FPUC's 2017 distribution service reliability report.

Gulf Power Company: Actual Data

Table 2-4 provides an overview of Gulf's CMI and CI figures for 2017. Excludable outage events accounted for approximately 28 percent of the minutes of interruption experienced by Gulf's customers. The biggest impact on CMI was Named Storms, which accounted for approximately 14 percent of the excludable minutes of interruption. Hurricanes Irma and Nate, and Tropical Storm Cindy affected all three regions of Gulf's service area. Gulf reported five tornados, which accounted for approximately 4 percent of the excludable minutes of interruption. The tornados affected the following regions:

- Eastern region on January 21, January 22, and June 21, 2017
- Central region on January 21, January 22, May 21, and June 21, 2017
- Western region on January 2, January 21, January 22, and June 21, 2017

Gulf reported that all of its regions were affected by transmission events, which accounted for 7 percent of the excluded minutes of interruptions. The causes for the transmission events include erroneous operations, external utility trouble, severe weather, deterioration, failed equipment, animal, lightning, vegetation, relay misoperation, and planned outages. Gulf explained that external utility trouble is defined as an outage occurring on another utility's system that affects Gulf's facilities or its customers. When this outage occurs, Gulf will sectionalize from the other utility if possible and restore the system after the utility has made its repairs. Gulf reported the cause of the external utility trouble was due to lightning and vegetation and affected the Central region. Gulf further explained the relay misoperation was due to a lightning strike causing two breakers to open simultaneously.

Table 2-4.
Gulf's 2017 Customer Minutes of Interruption and Customer Interruptions

2017	Customer Minutes of Interruption (CMI)		Customer Interruptions (CI)	
	Value	**% of Actual**	**Value**	**% of Actual**
Reported Actual Data	**74,779,078**		**792,046**	
Documented Exclusions				
Planned Service Interruptions	3,140,466	4.20%	58,073	7.33%
Named Storms	10,292,926	13.76%	60,376	7.62%
Tornadoes	2,766,752	3.70%	13,088	1.65%
Ice on Lines		0.00%		0.00%
Planned Load Management Events		0.00%		0.00%
Generation/Transmission Events	4,947,579	6.62%	107,793	13.61%
Extreme Weather (EOC Activation/Fire)		0.00%		0.00%
Reported Adjusted Data	**53,631,355**	**71.72%**	**552,716**	**69.78%**

Source: Gulf's 2017 distribution service reliability report.

Tampa Electric Company: Actual Data

Table 2-5 provides an overview of TECO's CMI and CI figures for 2017. Excludable outage events accounted for approximately 77 percent of the minutes of interruption experienced by TECO's customers. TECO reported that all regions were impacted by Hurricane Irma from September 10-18, 2017. The Named Storms account for approximately 71 percent of the excludable minutes of interruption.

The Generation/Transmission events accounted for approximately 3 percent of the excludable minutes of interruption. TECO reported 13 transmission outages in 2017. The causes listed included equipment failure, vehicle collision, vegetation related, and other weather. TECO reported that all equipment failures were repaired, structures replaced, overgrown vegetation were trimmed, and poles were repaired.

Table 2-5.
TECO's 2017 Customer Minutes of Interruptions and Customer Interruptions

2017	Customer Minutes of Interruption (CMI)		Customer Interruptions (CI)	
	Value	% of Actual	Value	% of Actual
Reported Actual Data	**244,456,219**		**1,441,901**	
Documented Exclusions				
Planned Service Interruptions	7,020,124	2.87%	156,999	10.89%
Named Storms	173,523,001	70.98%	300,668	20.85%
Tornadoes		0.00%		0.00%
Ice on Lines		0.00%		0.00%
Planned Load Management Events		0.00%		0.00%
Generation/Transmission Events	8,469,160	3.46%	202,686	14.06%
Extreme Weather (EOC Activation/Fire)		0.00%		0.00%
Reported Adjusted Data	**55,443,934**	**22.68%**	**781,548**	**54.20%**

Source: TECO's 2017 distribution service reliability report.

Section III: Adjusted Distribution Service Reliability Review of Individual Utilities

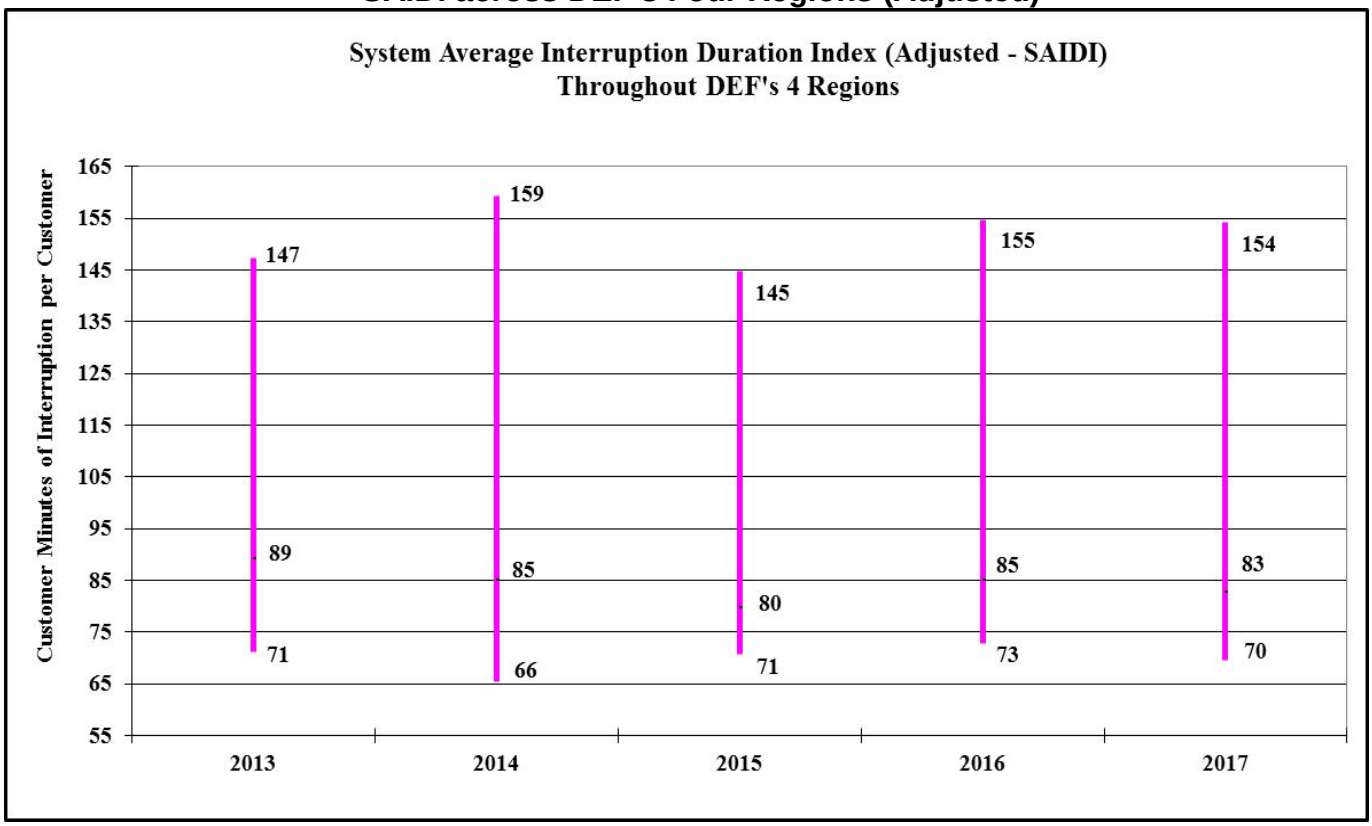
The adjusted distribution reliability metrics or indices provide insight into potential trends in a utility's daily practices and maintenance of its distribution facilities. This section of the review is based on each utility's reported adjusted data.

Duke Energy Florida, LLC: Adjusted Data

Figure 3-1 charts the adjusted SAIDI recorded across DEF's system and depicts decreases in the lowest, the average and highest values for 2017. DEF reported that 2017 presented the Utility with the most challenging weather related year. DEF notes that there were seven days in 2017 that had weather-related outages from afternoon thunderstorms, which resulted in the cause of more than 50 percent of customer outages on those days.

DEF's service territory is comprised of four regions: North Coastal, South Coastal, North Central, and South Central. **Figure 3-1** illustrates that the North Coastal region continues to report the poorest SAIDI over the last five years, fluctuating between 147 minutes and 154 minutes. While the South Coastal and South Central regions have the best or lowest SAIDI for the same period. The North Coastal region is rural and has more square miles when compared to the other regions. This region is also served by predominantly long circuits with approximately 7,700 miles of overhead and underground main circuits. DEF explained that these factors result in higher exposure to outage causes and higher reliability indices.

Figure 3-1.
SAIDI across DEF's Four Regions (Adjusted)



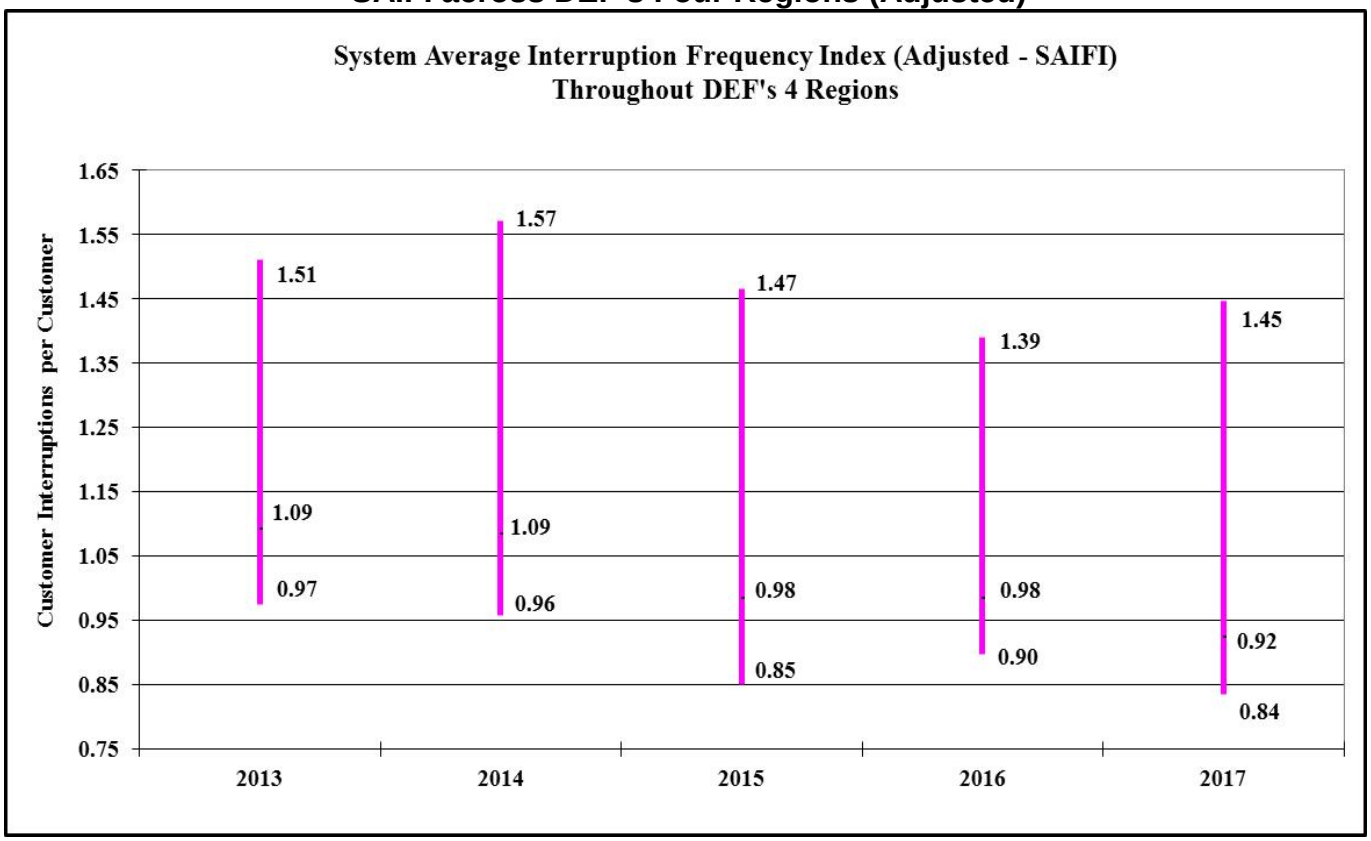
DEF's Regions with the Highest and Lowest Adjusted SAIDI Distribution Reliability Performance by Year

	2013	2014	2015	2016	2017
Highest SAIDI	North Coastal	North Coastal	North Coastal	North Coastal	North Coastal
Lowest SAIDI	South Coastal	South Coastal	South Central	South Coastal	South Central

Source: DEF's 2013-2017 distribution service reliability reports.

Figure 3-2 shows the adjusted SAIFI across DEF's system. The minimum, maximum, and average SAIFI indexes are trending downward. There were decreases of 6 percent for the minimum value, and 6 percent for the average value, and an increase of 9 percent for the maximum value, in 2017. The South Central region had the lowest number of interruptions, while the North Coastal region continues to have the highest number of interruptions.

Figure 3-2.
SAIFI across DEF's Four Regions (Adjusted)



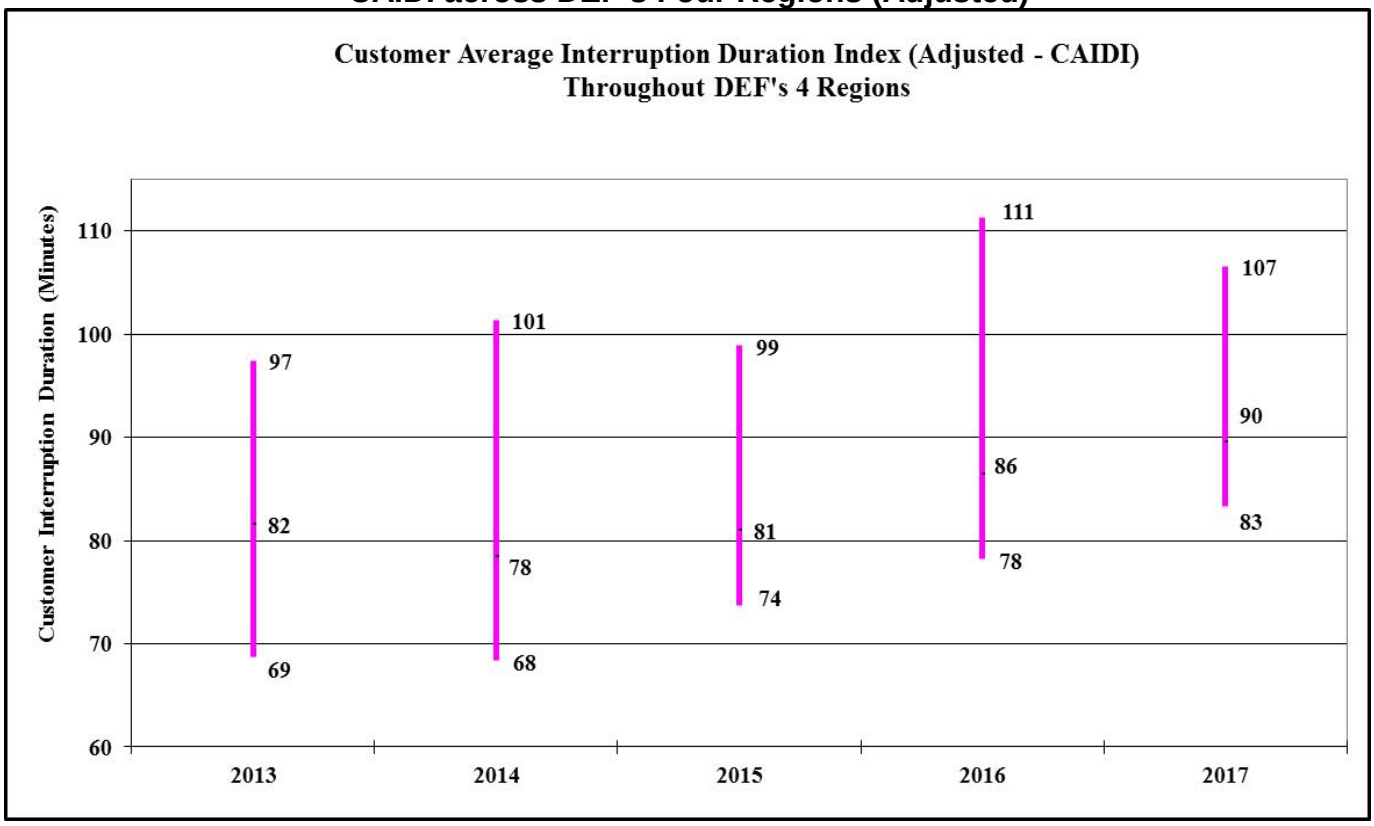
DEF's Regions with the Highest and Lowest Adjusted SAIFI Distribution Reliability Performance by Year

	2013	2014	2015	2016	2017
Highest SAIFI	North Coastal	North Coastal	North Coastal	North Coastal	North Coastal
Lowest SAIFI	South Central	South Coastal	North Central	South Coastal	South Central

Source: DEF's 2013-2017 distribution service reliability reports.

Figure 3-3 illustrates the CAIDI, or the average number of minutes a customer is without power when a service interruption occurs, for DEF's four regions. DEF's adjusted CAIDI is increasing for a five-year period from 82 minutes in 2013 to 90 minutes in 2017. The North Coastal region has continued to have the highest CAIDI level for the past five years with the maximum CAIDI trending upward. The South Central region had the lowest CAIDI level during the same period with the minimum CAIDI trending upward.

Figure 3-3.
CAIDI across DEF's Four Regions (Adjusted)



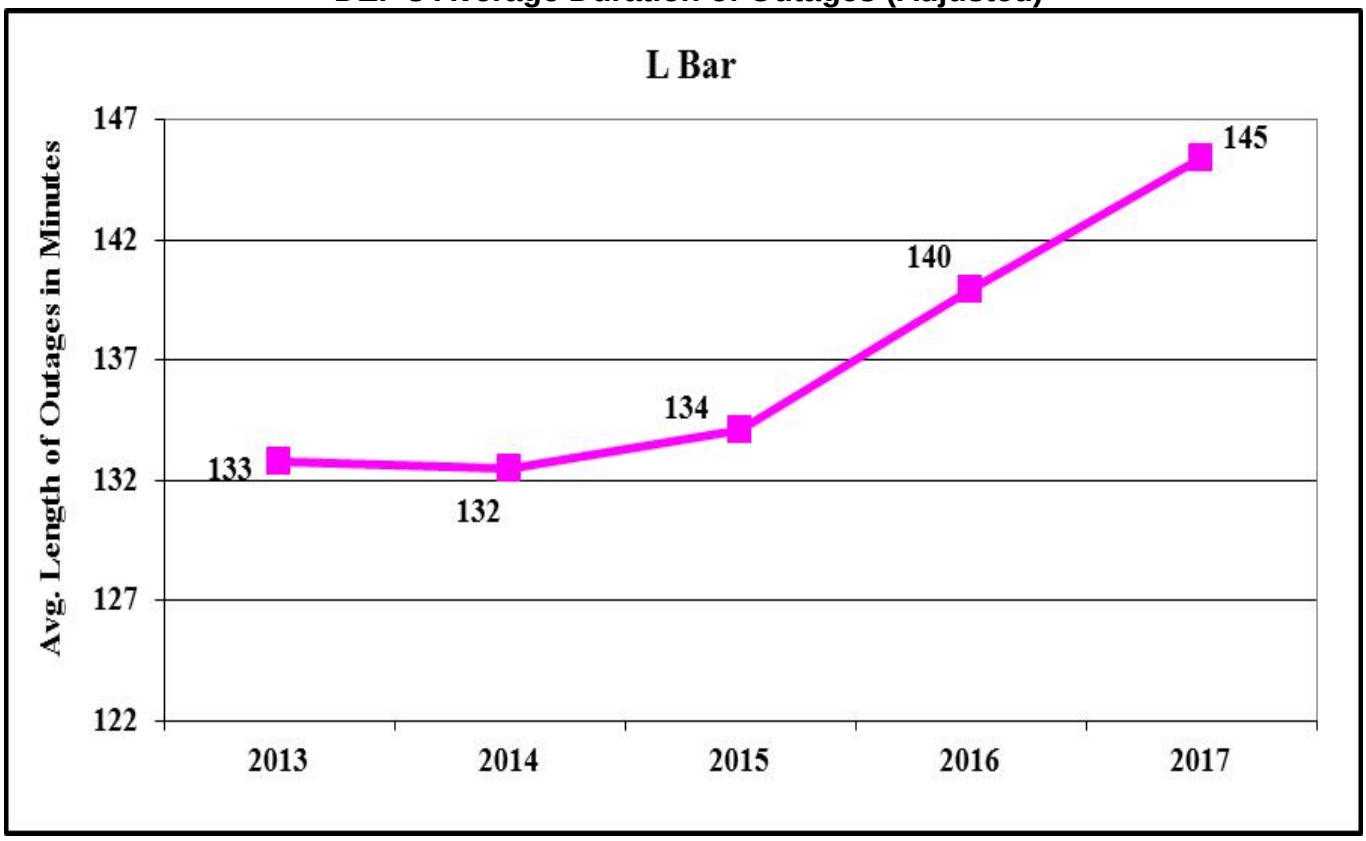
DEF's Regions with the Highest and Lowest Adjusted CAIDI Distribution Reliability Performance by Year

	2013	2014	2015	2016	2017
Highest CAIDI	North Coastal	North Coastal	North Coastal	North Coastal	North Coastal
Lowest CAIDI	South Coastal	South Coastal	South Coastal	South Central	South Central

Source: DEF's 2013-2017 distribution service reliability reports.

Figure 3-4 is the average length of time DEF spends restoring customers affected by outage events, excluding hurricanes and certain other outage events. This is displayed by the index L-Bar in the graph below. The data demonstrates an overall 8 percent increase of outage durations since 2013, and a 3 percent increase from 2016 to 2017. DEF's overall L-Bar index is trending upward, indicating that DEF is spending more time restoring service from outage events.

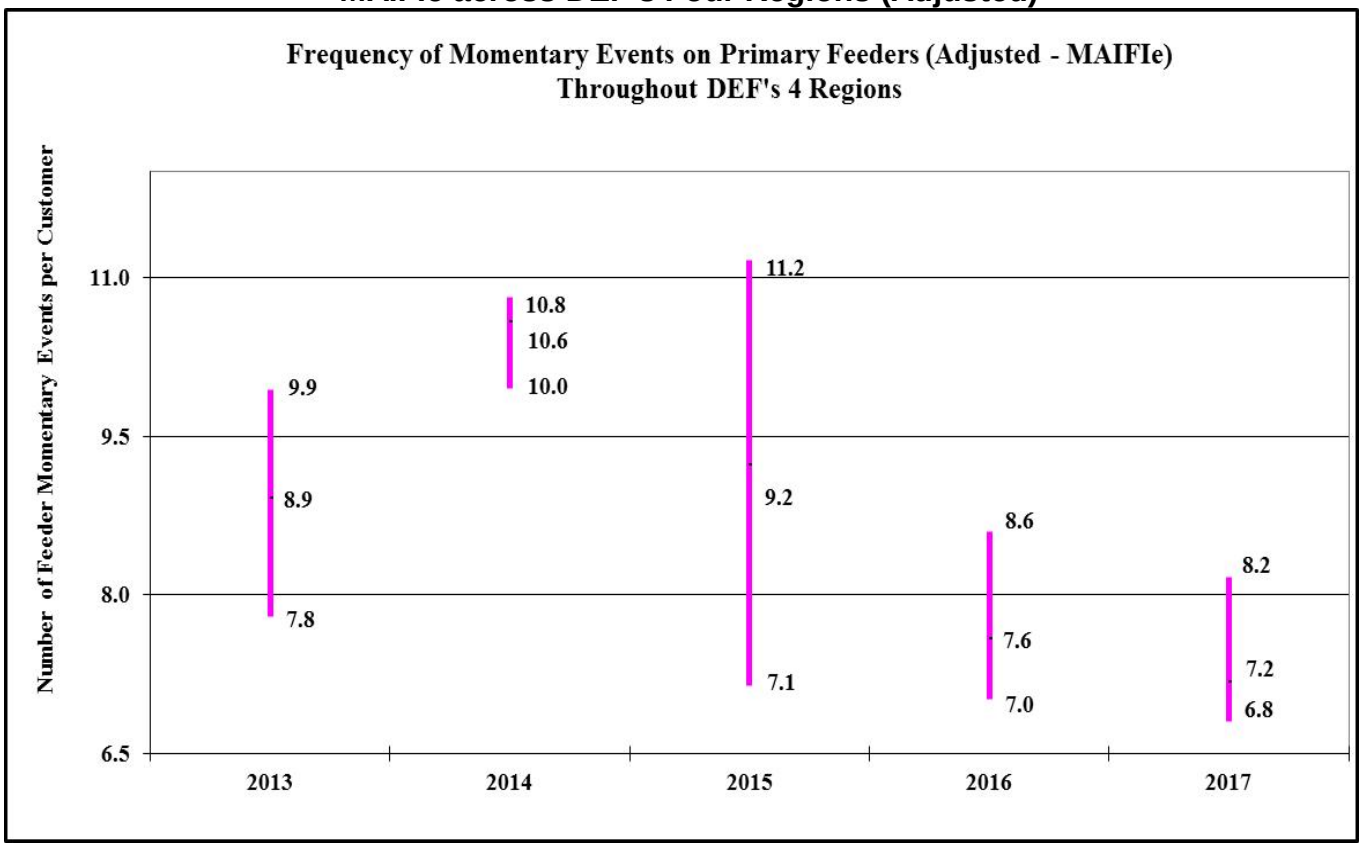
Figure 3-4.
DEF's Average Duration of Outages (Adjusted)



Source: DEF's 2013-2017 distribution service reliability reports.

Figure 3-5 illustrates the frequency of momentary events on primary circuits for DEF's customers recorded across its system. These momentary events often affect a small group of customers. A review of the supporting data suggests that the MAIFIe results between 2013 and 2017 appear to be trending downward showing improvement and there was a decrease in the average MAIFIe of 5 percent from 2016 to 2017. The North Coastal, South Central, and South Coastal regions appear to have the best (lowest) results for the last five years. There was a 3 percent decrease for the lowest MAIFIe from 2016 to 2017. The South Coastal, North Central, and North Coastal regions appear to have the worst (highest) results for the last five years. There was a 5 percent decrease from 2016 to 2017.

Figure 3-5.
MAIFIe across DEF's Four Regions (Adjusted)



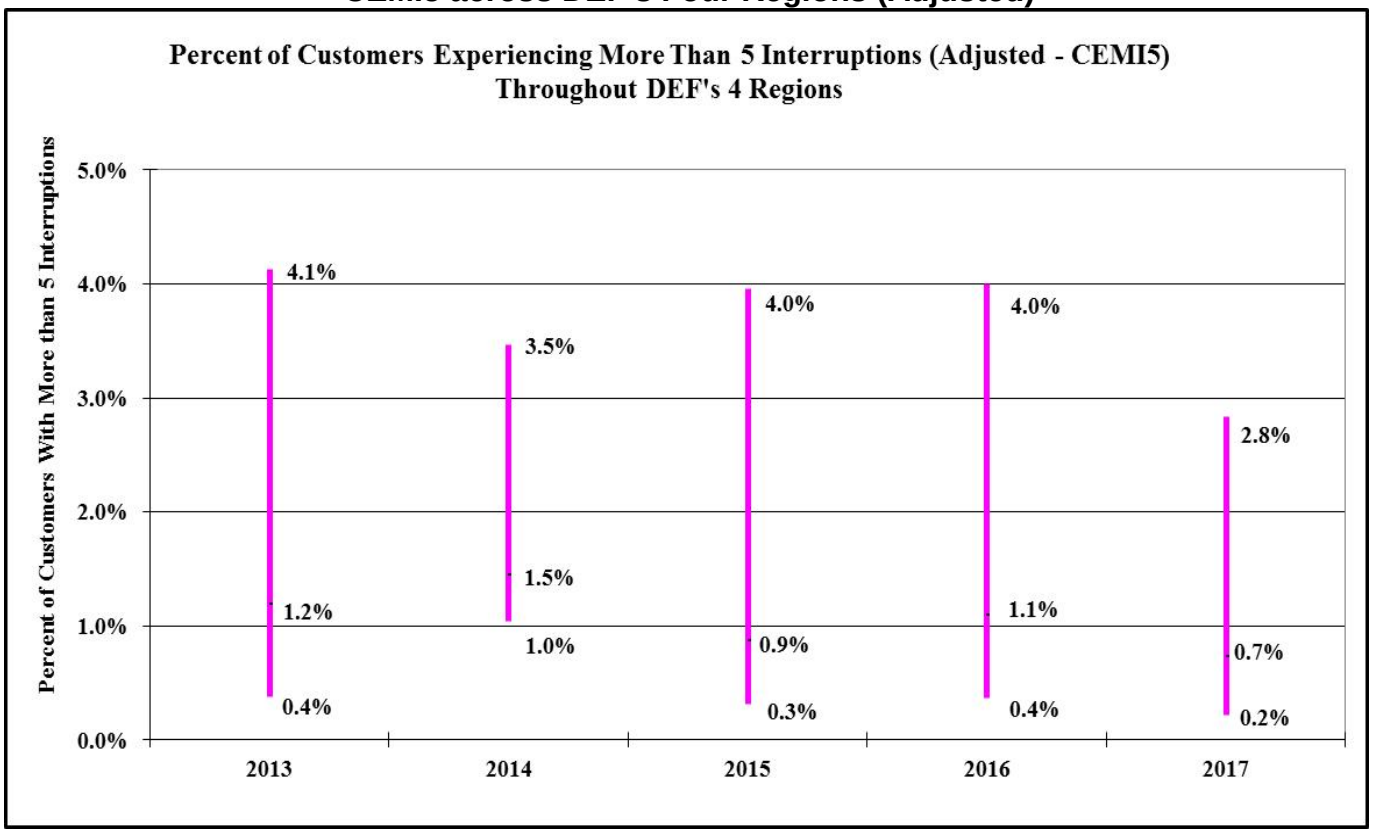
DEF's Regions with the Highest and Lowest Adjusted MAIFIe Distribution Reliability Performance by Year

	2013	2014	2015	2016	2017
Highest MAIFIe	South Coastal	North Central	South Coastal	North Central	North Coastal
Lowest MAIFIe	South Central	North Coastal	North Coastal	South Central	South Coastal

Source: DEF's 2013-2017 distribution service reliability reports.

Figure 3-6 charts the percentage of DEF's customers experiencing more than five interruptions over the last five years. DEF reported a decrease in the average CEMI5 performance from 1.1 percent in 2016 to 0.7 percent in 2017. The average CEMI5 is trending downward over the past five years. The South Coastal region has the lowest reported percentage for all of DEF's regions and the North Coastal region continues to have the highest reported percentage.

Figure 3-6.
CEMI5 across DEF's Four Regions (Adjusted)



DEF's Regions with the Highest and Lowest Adjusted CEMI5 Distribution Reliability Performance by Year

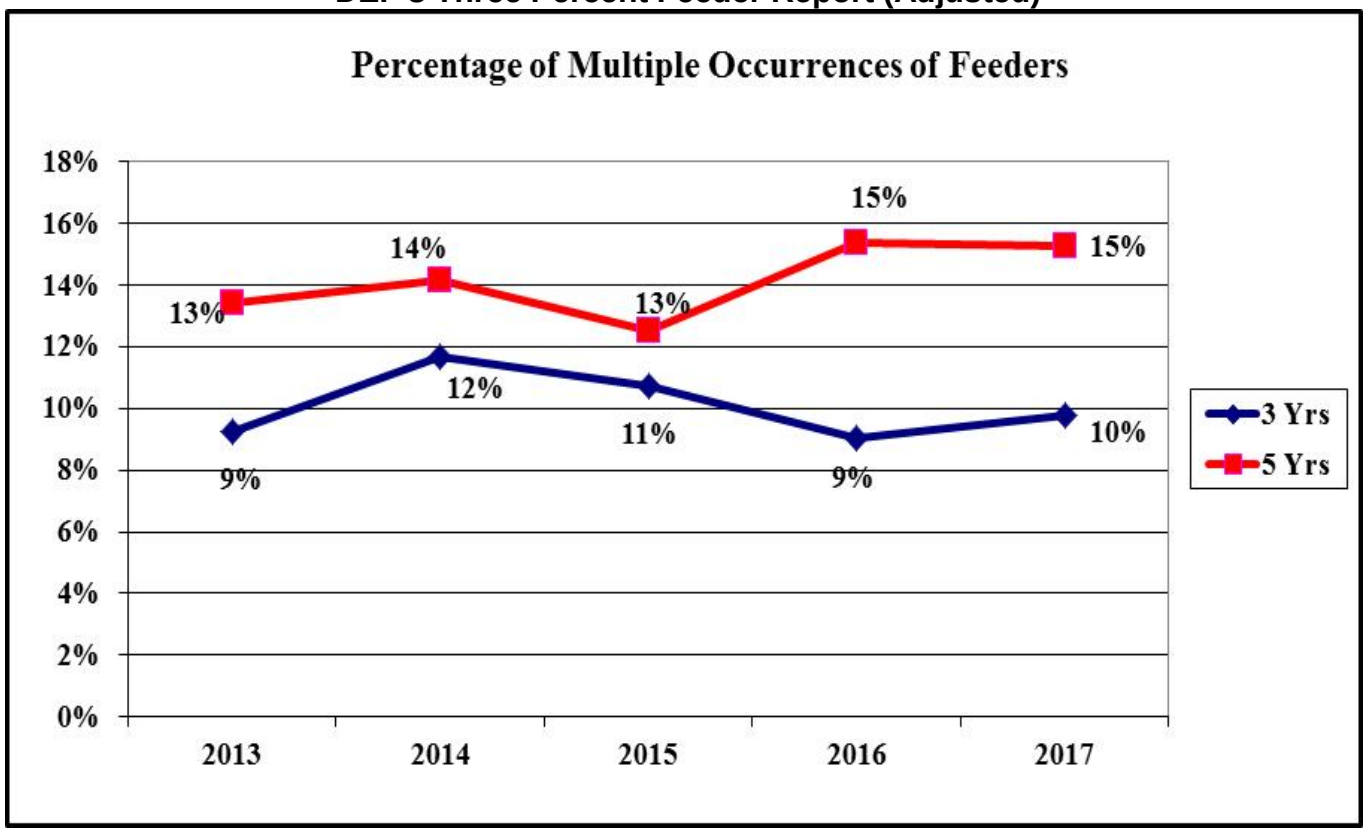
	2013	2014	2015	2016	2017
Highest CEMI5	North Coastal	North Coastal	North Coastal	North Coastal	North Coastal
Lowest CEMI5	South Coastal	South Central	North Central	North Central	South Coastal

Source: DEF's 2013-2017 distribution service reliability reports.

Figure 3-7 shows the fraction of multiple occurrences of feeders using a three-year and five-year basis. During the period of 2013 to 2017, the five-year fraction of multiple occurrences is trending upward as the three-year fraction of multiple occurrences is trending downward. The Three Percent Feeder Report lists the top 3 percent of feeders with the most feeder outage events. The fraction of multiple occurrences is calculated from the number of recurrences divided by the number of feeders reported.

Five of DEF's feeders have been on the Three Percent Feeder Report for three years or more with the last two years consecutively. The outages varied from equipment failure, public dig-ins into an underground cable, vehicular accident, vegetation, thunderstorms, and contractor error. DEF explained that the outage due to contractor error was because the feeder had a hot-line tag, which prevents the reclosing device from going through its normal operations to clear a temporary fault, while the contractors were performing work on the feeder. When the outage occurred, the breaker opened after the first operation creating a permanent fault. DEF replaced the failing equipment, trimmed trees, and performed infrared scans on the feeders. All issues found during the infrared scans were corrected. DEF claims that its operations technicians will continue to analyze feeder and perform an in-depth patrol to identify operational issues and initiate mitigation actions.

Figure 3-7.
DEF's Three Percent Feeder Report (Adjusted)

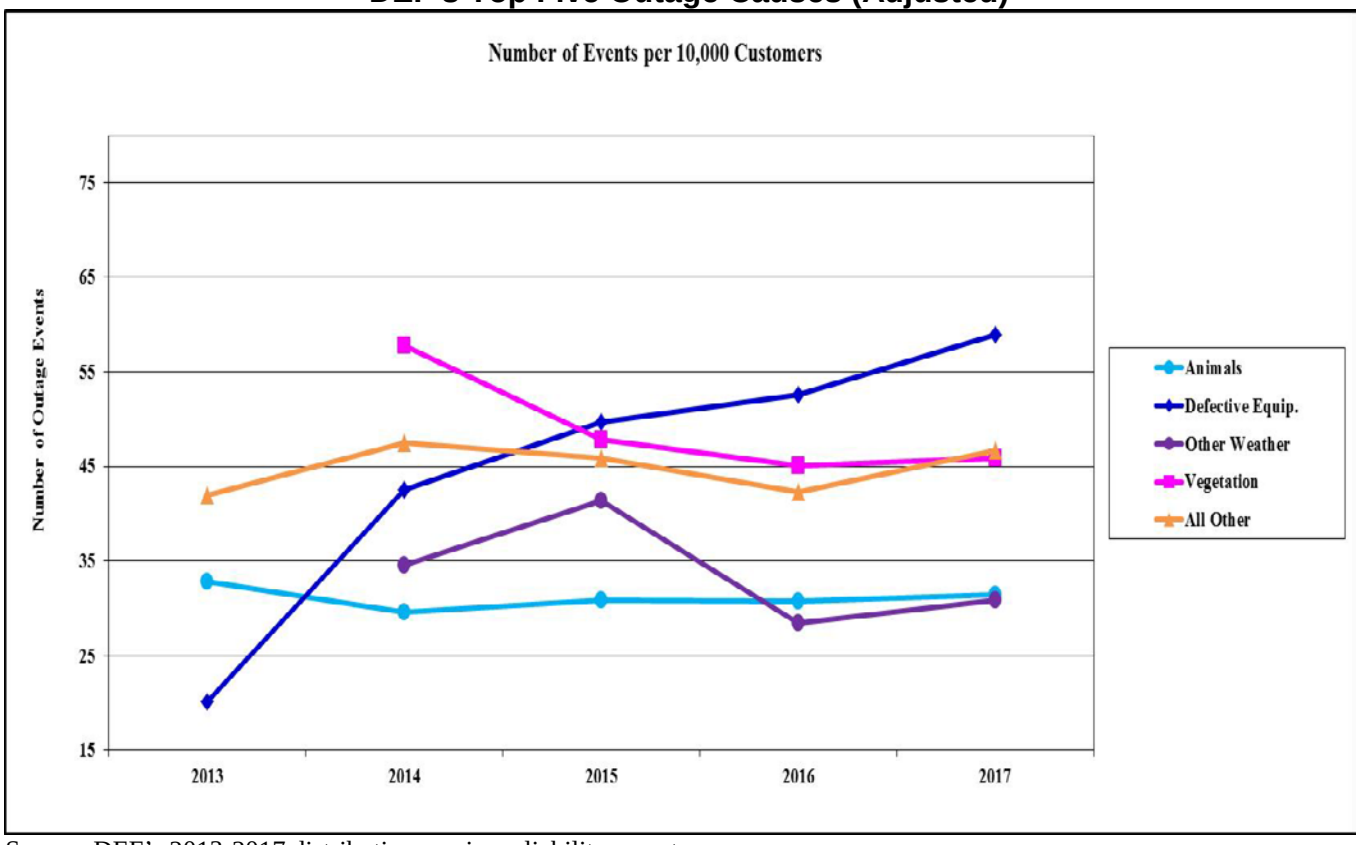


Source: DEF's 2013-2017 distribution service reliability reports.

Figure 3-8 shows the top five causes of outage events on DEF's distribution system normalized to a 10,000-customer base. The figure is based on DEF's adjusted data and represents approximately 93 percent of the top 10 causes of outage events that occurred during 2017. For the five-year period, the top five causes of outage events were Defective Equipment (26 percent), Vegetation (20 percent), All Other (20 percent), Animals (14 percent), and Other Weather (13 percent) on a cumulative basis. Commission staff requested that, beginning with 2014 data, all IOU's use the same outage categories for comparison purposes. As such, the Vegetation, Defective Equipment, and Other Weather now include outage categories that in the past were separately identified. The outage events caused by Vegetation and Other Weather are trending downward even though the Other Weather category had an increase of 8 percent in 2017. DEF reported that it prioritizes the reliability improvements action plan by balancing historical and current year performance. In addition, current year performance is monitored monthly to identify emergent and seasonal issues including load balancing for cold weather and the need for foot patrols of devices experiencing multiple interruptions.

To address outages related to Defective Equipment, DEF is continuing to invest in proactive system maintenance activities, such as pole replacements, pad-mounted transformer replacements, and underground cable replacements. In 2018, DEF plans to invest in proactive switchgear replacements, overhead transformer retrofits, and other reliability programs.

Figure 3-8.
DEF's Top Five Outage Causes (Adjusted)



Source: DEF's 2013-2017 distribution service reliability reports.

Observations: DEF's Adjusted Data

DEF's SAIDI, SAIFI, MAIFIe, CEMI5 and the Three-Year Percent of Multiple Feeder Outage Events are trending downward over the past five years. The CAIDI, L-Bar, and the Five-Year Percent of Multiple Feeder Outage Events are all trending upward over the five-year period. All of the reliability indices, except for CAIDI, L-Bar, and the Three-Year Percent of Multiple Feeder Outage Events, had decreases from 2016 to 2017. The results for the North Coastal Region have continually demonstrated the highest (poorest) service reliability indices of the four regions within DEF for the past five years. The North Coastal region is rural and has more square miles compared to DEF's other service territories.

DEF reported that 2017 presented the Utility with the most challenging weather related year. DEF also reported that there were seven days in 2017 that had weather-related outages from afternoon thunderstorms, which resulted in the cause of more than 50 percent of customer outages on those days.

In 2017, DEF continued its multi-year program to install new electronic reclosers by installing 182 reclosers. The electronic reclosers are designed to reduce the overall number and duration of outages by increased sectionalization on distribution feeders. This project will also improve the communication between the devices. DEF, also, in 2016, added additional staff to conduct analysis and reviews of the reliability data in order to reduce the number of outages and momentary interruptions.

DEF has also installed "self-healing teams" throughout its service territory. This is designed to mitigate the number of customers impacted by outages. DEF will continue to invest in small wire reconductor projects in areas of concerns and will be deploying self-optimizing grid projects beginning in 2018. The self-optimizing grid projects working with the "self-healing teams" will further limit the loss of power to customers and provide automatic fault isolation for multiple concurrent faults.

In 2018, DEF began work as part of its Grid Investment Plan targeting in North Coastal region eight feeders under the Transformer Retrofit Program, two feeders under the Deteriorated Conductor Program, and nine feeders under the Self-Optimizing Grid Program. This work is planned to increase in 2019 with, 10 feeders in the Transformer Retrofit Program, 8 feeders in the Deteriorated Conductor Program, and 24 in the Self-Optimizing Grid Program.

In order to help reduce outage times, DEF implemented nighttime on-duty coverage with its Line Techs in the South Coastal and Central regions. This will drive faster response during the overnight hours by having resources on site and ready to respond. In addition, during periods of increased outage events, DEF engages its contract resources and has vegetation management resources on call to aid in outage response.

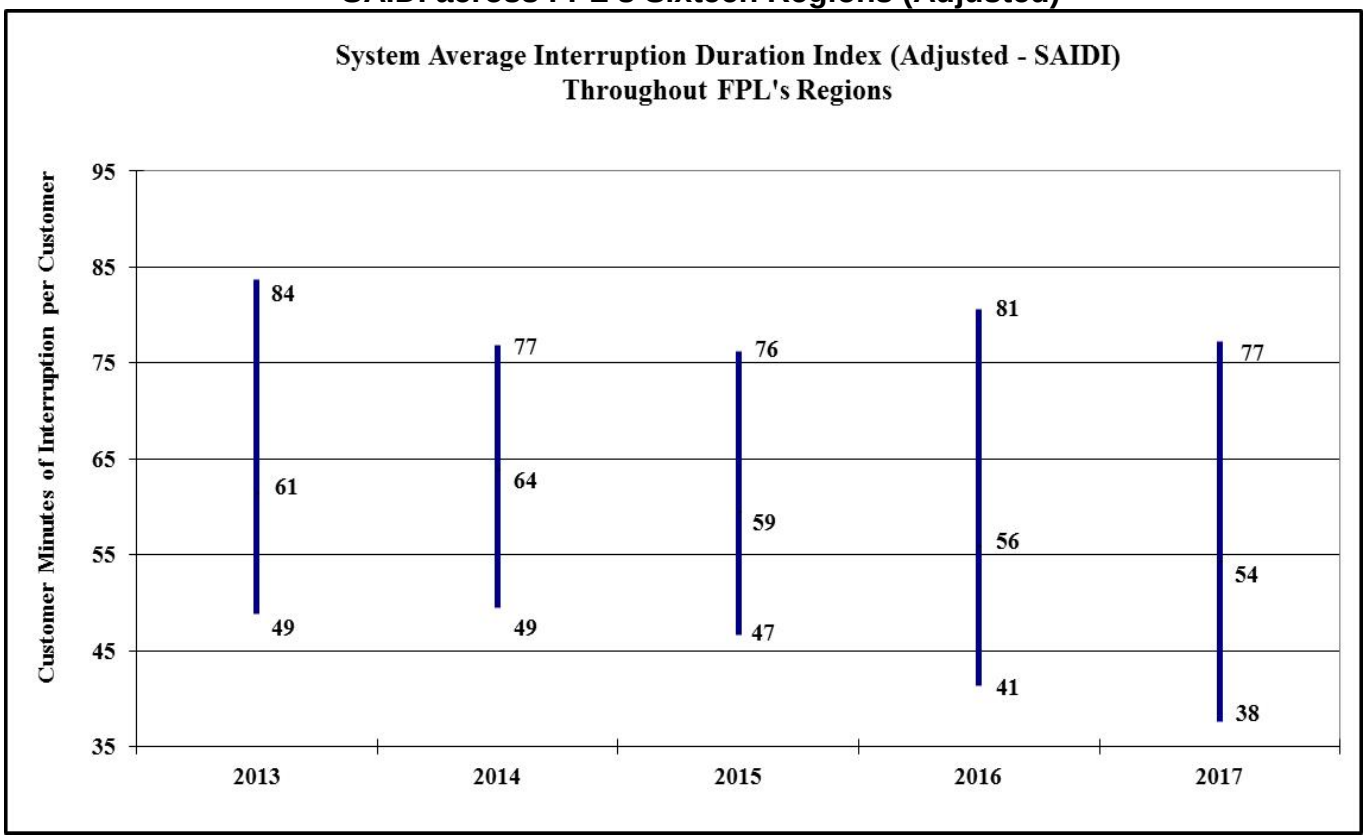
To help improve reliability to its customer, DEF has initiated a targeted undergrounding program. This program focuses on historically poor performing overhead lateral circuits and is scheduled to begin in 2018, ending in 10 years. DEF estimates it will covert approximately 1,200 lateral circuits in 30 counties. DEF will start with simple tap line and extended tap line scenarios in order to test its methods, processes and tools and to incorporate lessons learned before starting on more complex neighborhood and community scenarios. DEF provided an overview of its

targeted undergrounding program during the Commission's Internal Affairs meeting on August 7, 2018. Staff will continue to monitor the targeted underground program and report on the progress.

Florida Power & Light Company: Adjusted Data

Figure 3-9 shows the highest, average, and lowest adjusted SAIDI recorded across FPL's system that encompasses four management regions with 16 service areas. The highest and lowest SAIDI values are the values reported for a particular service area. FPL had an overall decrease of two minutes (4 percent) to its average SAIDI results for 2017 compared to 2016. The average SAIDI appears to be trending downward over the five-year period of 2013 to 2017. The Pompano region has the best SAIDI results for two out of the five years.

Figure 3-9.
SAIDI across FPL's Sixteen Regions (Adjusted)



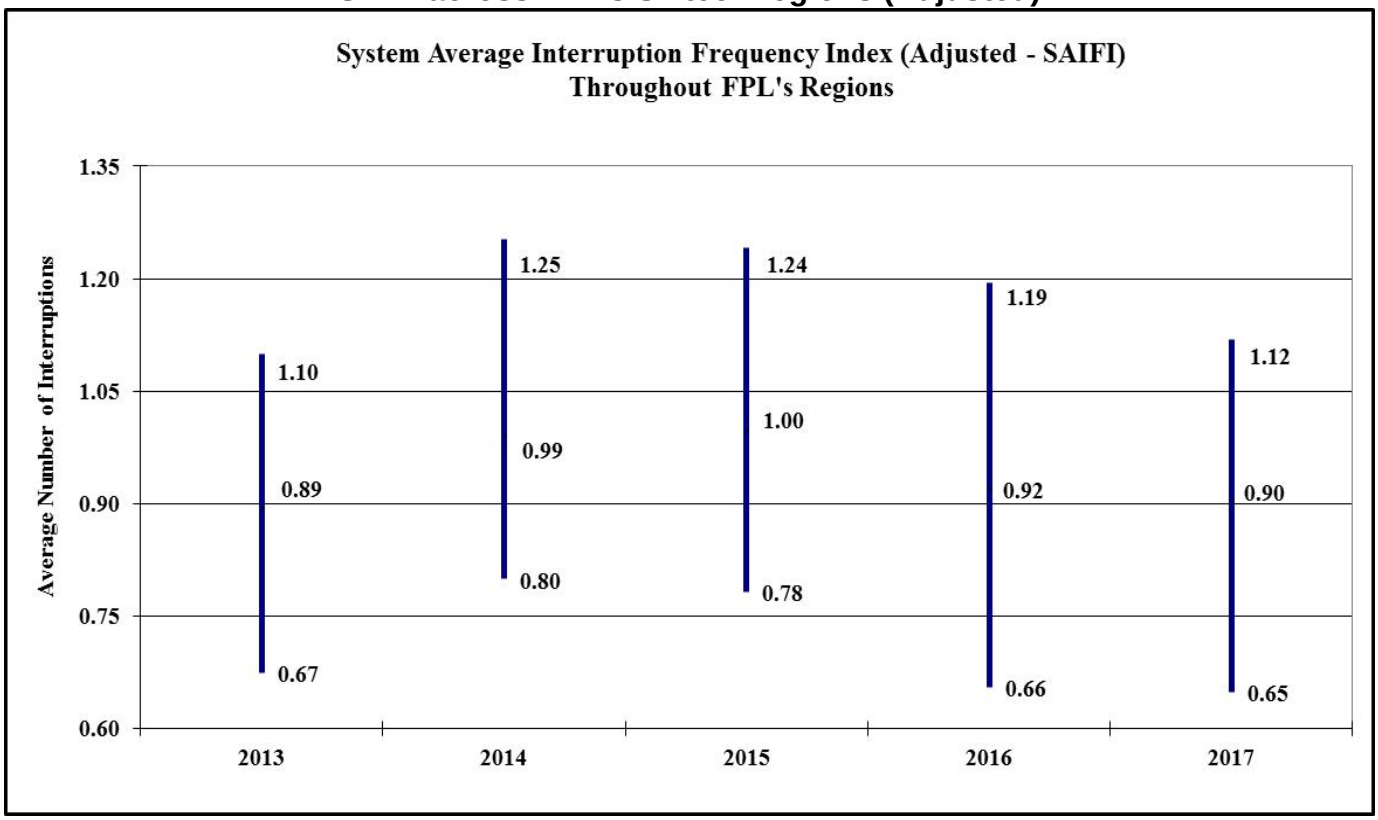
FPL's Regions with the Highest and Lowest Adjusted SAIDI Distribution Reliability Performance by Year

	2013	2014	2015	2016	2017
Highest SAIDI	North Florida	North Dade	South Dade	Treasure Coast	Toledo Blade
Lowest SAIDI	Pompano	West Palm	Central Dade	Central Dade	Pompano

Source: FPL's 2013-2017 distribution service reliability reports.

Figure 3-10 is a chart of the highest, average, and lowest adjusted SAIFI across FPL's system. FPL had a decrease in the system average results to 0.90 outages in 2017, compared to 0.92 outages in 2016, which is a 2 percent decrease. FPL reported a decrease in the highest SAIFI of 1.12 interruptions in 2017 compared to 1.19 interruptions in 2016. The region reporting the lowest adjusted SAIFI for 2017 was Pompano at 0.65 interruptions compared to 0.66 interruptions in the Central Dade region in 2016. The highest, average and lowest SAIFI appear to be trending downward during the period of 2013 to 2017.

Figure 3-10.
SAIFI across FPL's Sixteen regions (Adjusted)



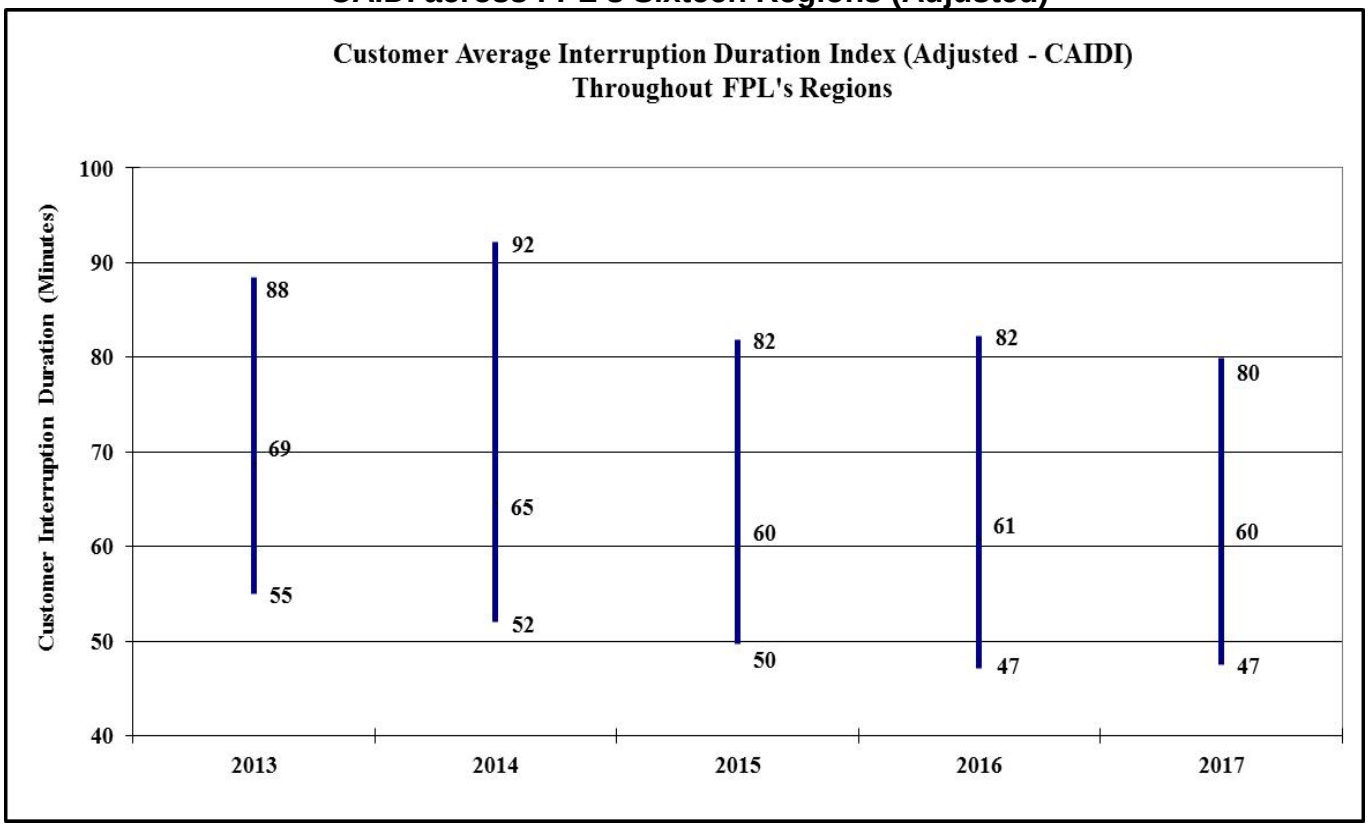
FPL's Regions with the Highest and Lowest Adjusted SAIFI Distribution Reliability Performance by Year

	2013	2014	2015	2016	2017
Highest SAIFI	Boca Raton	Wingate	West Dade	Treasure Coast	Toledo Blade
Lowest SAIFI	Central Dade	Central Dade	Central Dade	Central Dade	Pompano

Source: FPL's 2013-2017 distribution service reliability reports.

Figure 3-11 depicts FPL's highest, average, and lowest CAIDI expressed in minutes. FPL's adjusted average CAIDI has decreased approximately 2 percent from 61 minutes in 2016 to 60 minutes in 2017. The average duration of CAIDI is trending downward. For 2017, the West Palm service area reported the lowest duration of CAIDI at 47 minutes, which was the same in 2016. The highest duration of CAIDI was 80 minutes for the South Dade service area for 2017, which is a decrease from the recorded 82 minutes in 2016.

Figure 3-11.
CAIDI across FPL's Sixteen Regions (Adjusted)



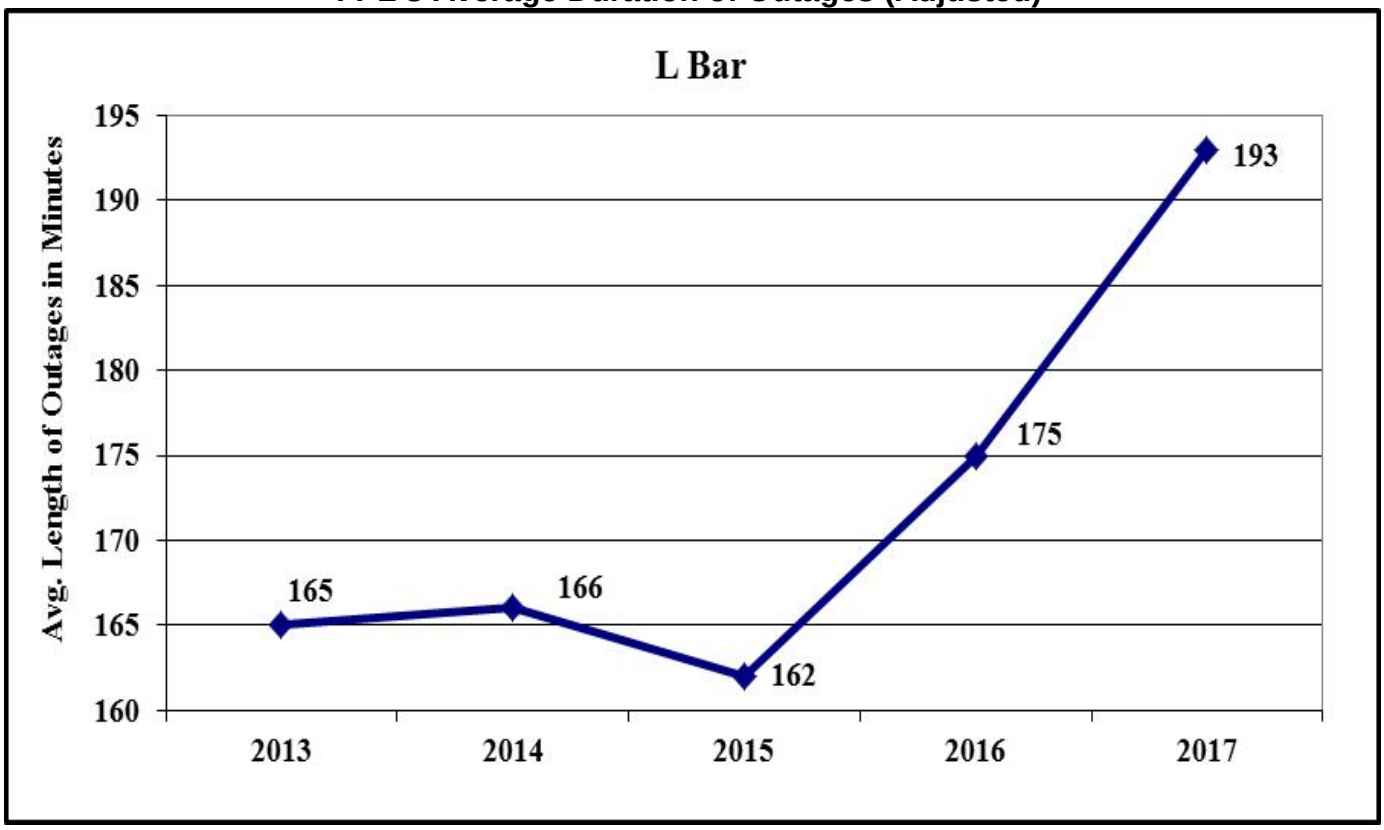
FPL's Regions with the Highest and Lowest Adjusted CAIDI Distribution Reliability Performance by Year

	2013	2014	2015	2016	2017
Highest CAIDI	North Dade	North Dade	North Dade	North Dade	South Dade
Lowest CAIDI	Boca Raton	Boca Raton	Boca Raton	Boca Raton	West Palm

Source: FPL's 2013-2017 distribution service reliability reports.

Figure 3-12 depicts the average length of time that FPL spends recovering from outage events, excluding hurricanes and other extreme outage events and is the index known as L-Bar (Average Service Restoration Time). FPL had a 9 percent increase in L-Bar from 175 minutes in 2016 to 193 minutes in 2017. There is a 14.5 percent overall increase since 2013 and the L-Bar is trending upward, indicating FPL is spending more time restoring service.

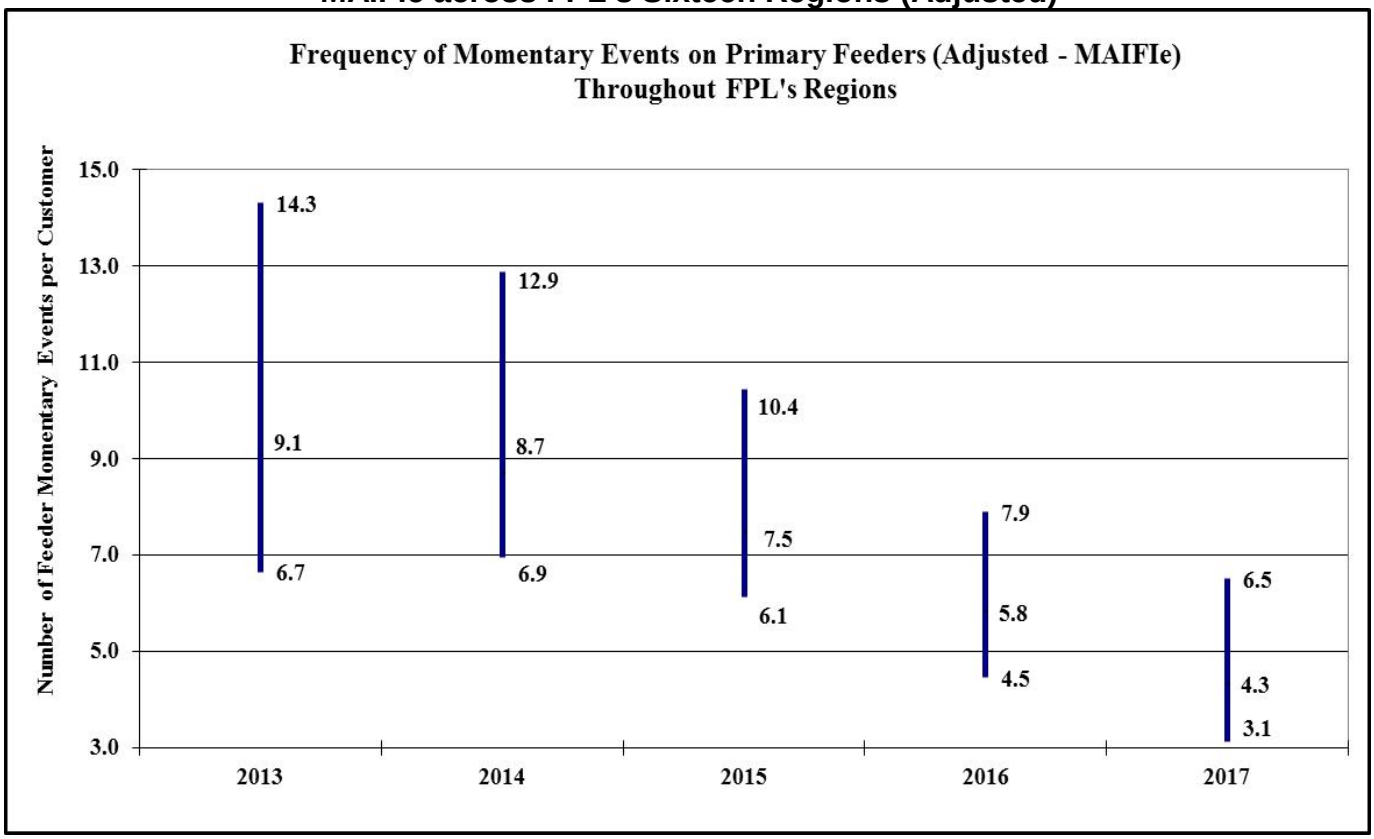
Figure 3-12.
FPL's Average Duration of Outages (Adjusted)



Source: FPL's 2013-2017 distribution service reliability reports.

Figure 3-13 is the highest, average, and lowest adjusted MAIFIe recorded across FPL's system. FPL's Treasure Coast and Wingate service areas have experienced the least reliable MAIFIe results of the 16 service areas of FPL since 2013. The Pompano, Central Dade, and Manasota service areas had the fewest momentary events since 2013. The results have been trending downward (improving) over the last five years. There is a 26 percent decrease in the average MAIFIe results from 2016 to 2017.

Figure 3-13.
MAIFIe across FPL's Sixteen Regions (Adjusted)



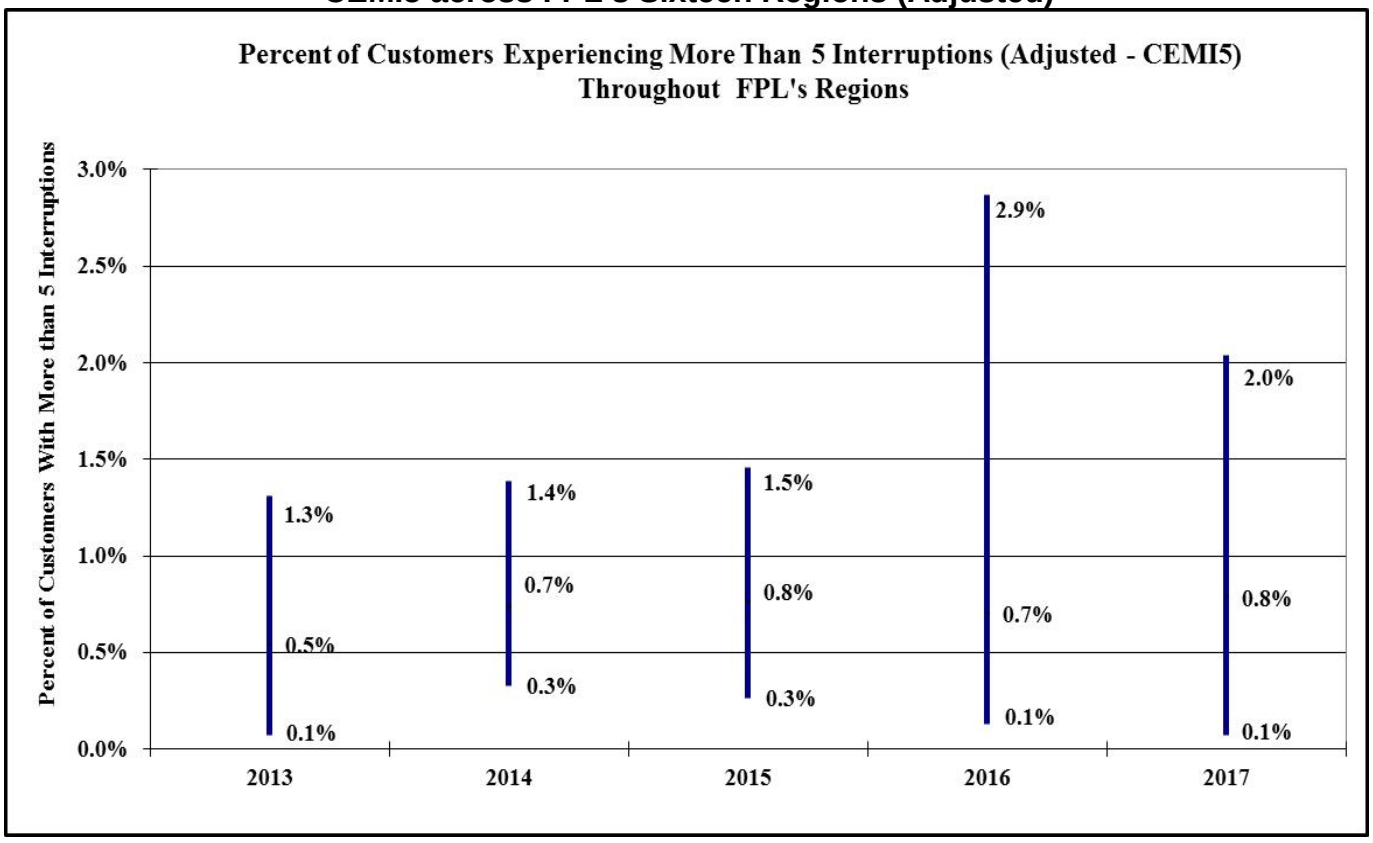
FPL's Regions with the Highest and Lowest Adjusted MAIFIe Distribution Reliability Performance by Year

	2013	2014	2015	2016	2017
Highest MAIFIe	Treasure Coast	Wingate	Wingate	Wingate	Wingate
Lowest MAIFIe	Central Dade	Pompano	Manasota	Pompano	Pompano

Source: FPL's 2013-2017 distribution service reliability reports.

Figure 3-14 shows the highest, average, and lowest adjusted CEMI5. FPL's customers with more than five interruptions per year appear to be increasing and trending upward. The service areas experiencing the highest CEMI5 over the five-year period appear to fluctuate among West Dade, Boca Raton, Treasure Coast, and West Palm. Pompano, Gulf Stream, and Brevard are reported as having the lowest percentages in the last five years. The average CEMI5 result for 2017 was 0.8 percent compared to 0.7 percent in 2016.

Figure 3-14.
CEMI5 across FPL's Sixteen Regions (Adjusted)



FPL's Regions with the Highest and Lowest Adjusted CEMI5 Distribution Reliability Performance by Year

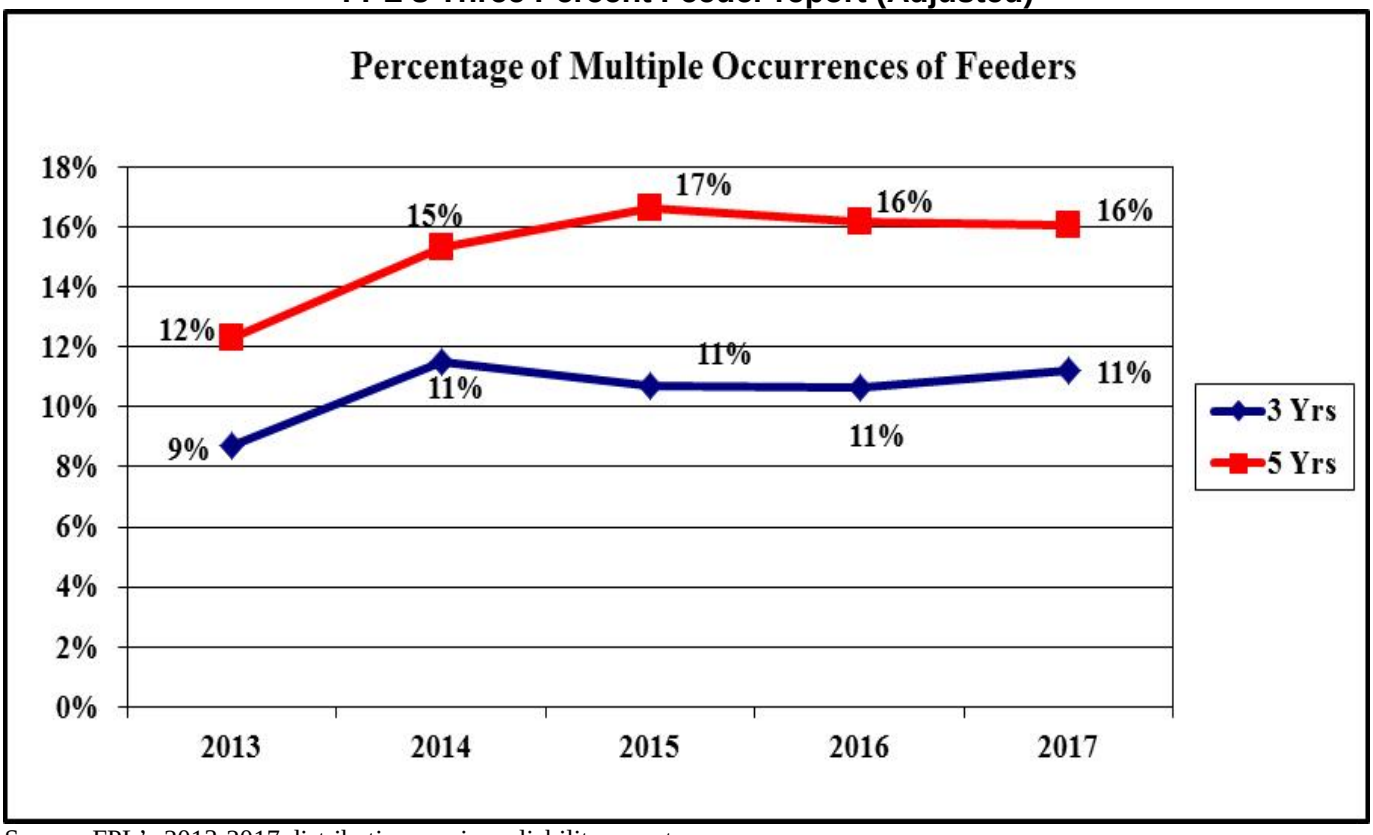
	2013	2014	2015	2016	2017
Highest CEMI5	Boca Raton	West Palm	West Dade	Treasure Coast	West Palm
Lowest CEMI5	Pompano	Brevard	Brevard	Gulf Stream	Pompano

Source: FPL's 2013-2017 distribution service reliability reports.

Figure 3-15 is a graphical representation of the percentage of multiple occurrences of FPL's feeders and is derived from The Three Percent Feeder Report, which is a listing of the top three percent of problem feeders reported by the utility. The fraction of multiple occurrences is calculated from the number of recurrences divided by the number of feeders reported. The three-year percentage had no change with 11 percent in 2016 and 11 percent in 2017. The five-year percentage also had no change with 16 percent in 2016 and the same percentage in 2017. Both the five-year percentage and the three-year percentage appear to be trending upward.

Staff notes six feeders were on the Three Percent Feeder Report the last two years. FPL reported that recently completed and future efforts to improve performance on the six feeders include equipment repairs (cross arms, lightning arrestors, insulators, and splices), vegetation management, and tree trimming. FPL also reported that four of these feeders are scheduled to be storm hardened in 2018.

Figure 3-15.
FPL's Three Percent Feeder report (Adjusted)

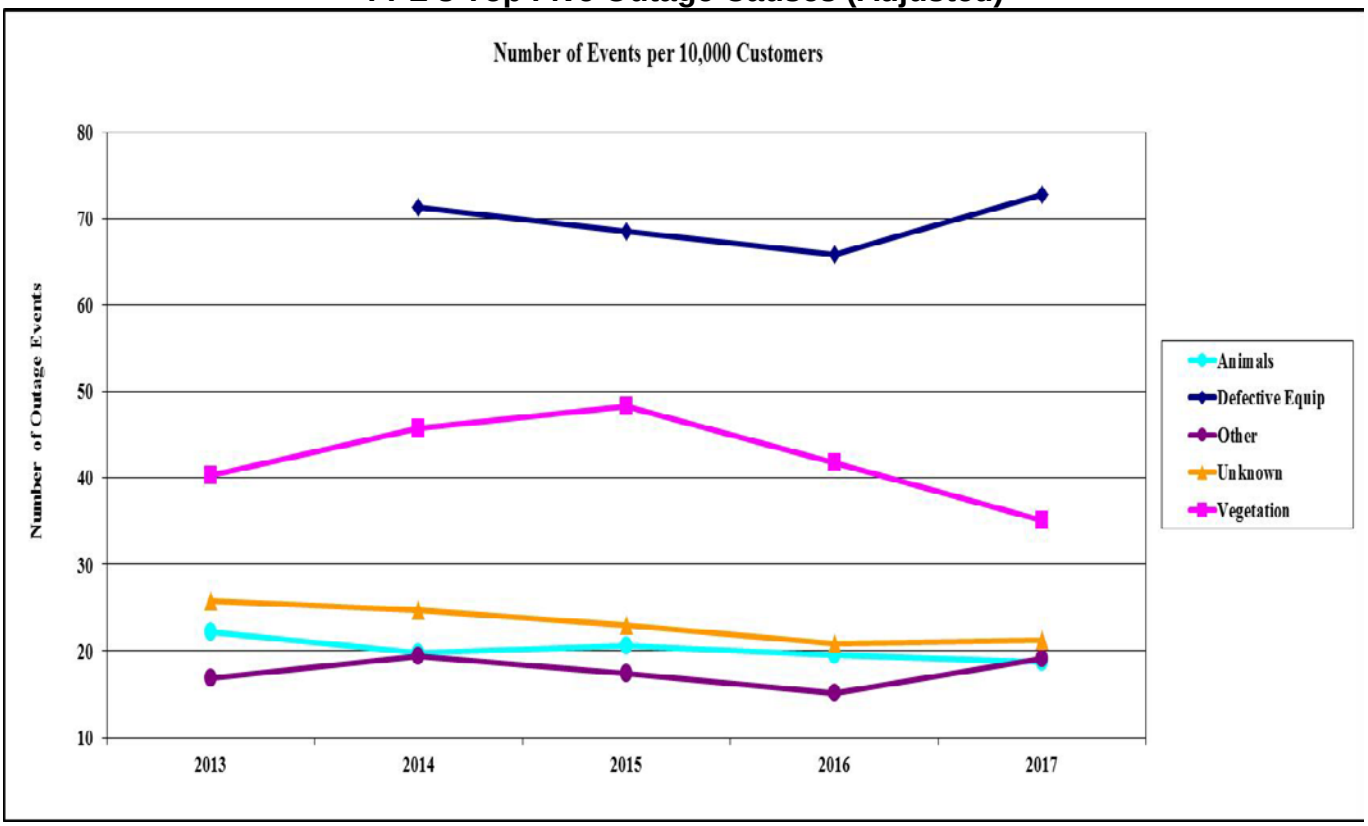


Source: FPL's 2013-2017 distribution service reliability reports.

Figure 3-16 depicts the top five causes of outage events on FPL's distribution system normalized to a 10,000-customer base. The graph is based on FPL's adjusted data of the top 10 causes of outage events. For the five-year period, the five top causes of outage events included Defective Equipment (38 percent), Vegetation (18 percent), Unknown (11 percent), Animals (10 percent), and Other (10 percent) on a cumulative basis. The outage events due to Vegetation, Animals and Unknown are trending downward as the Other category is relativity flat. The Defective Equipment category dominates the highest percentage of outage causes throughout the FPL regions. The data shows an increasing trend in outage events caused by Defective Equipment. The number of outages increased for the Defective Equipment category from 2016 to 2017. Starting in 2014, Defective Equipment includes Equipment Failure, Equipment Connect and Dig-in, which were all separate categories, in prior years.

Annually, FPL evaluates its current reliability remediation programs and verifies the program's need and/or existence. In addition, FPL proposes new reliability remediation programs to improve its reliability performance concentrating on the highest cause codes and those cause codes that have shown trends needing attention. FPL has 15 reliability programs listed for its 2018 budget. The programs include: priority feeder inspection, reduce the number of direct buried feeder and lateral cables, installing, relocating, and maintaining distribution capacitor banks, and replacing oil circuit reclosers with electronic reclosers. Eleven programs are designed to help improve the Defective Equipment cause code, which had an increase in 2017. Six programs will help to improve the Unknown and Other cause codes, which also had an increase in 2017. In addition to the reliability programs identified by FPL in its report, the Utility is planning to inspect and repair or replace auto transformers, as necessary. This program will also help address the Defective Equipment and Animals cause codes.

Figure 3-16.
FPL's Top Five Outage Causes (Adjusted)



Source: FPL's 2013-2017 distribution service reliability reports.

Observations: FPL's Adjusted Data

The least reliable overall results seem to fluctuate between FPL's different service areas, as do the best service reliability results. The 2017 report shows the system indices for SAIDI, SAIFI, CAIDI, and MAIFe, are lower or better than the 2016 results. The system index for CEMI5 and L-Bar are higher than the 2016 results. There was no change in the Three-Year Percentages of Multiple Feeder Outage events and the Five-Year Percentages of Multiple Feeder Outage events results. FPL explains that it evaluates its current reliability programs annually to verify the program's need and/or existence. In addition, FPL proposes new reliability programs to improve its reliability performance concentrating on the highest cause codes and those cause codes that have shown trends needing attention. The cause codes that FPL will be concentrating on to improve are Equipment Failures, Unknown, and Other causes of outages. FPL is also continuing to increase the utilization of automation to address feeder interruptions.

The Wingate region has had the highest MAIFIe for four years consecutively. However, the MAIFIe value for the Wingate region did improve by 18 percent in 2017. FPL is performing targeted vegetation trimming, increasing the number of investigative feeder patrols, and installing automated lateral switches to improve reliability in the Wingate region. FPL also reported that some reliability programs to address momentary issues would address some of Wingate feeders. These programs are priority feeder programs and overhead line inspections.

To address the declining performance of FPL's overall system CEMI5, the Utility has completed 439 visual assessments and 283 thermal inspections of the CEMI5 risk feeders and addressed issues found with 373 feeders. In addition, FPL initiated reliability assessments prior to starting any hardening project to proactively identify potential reliability issues, which resulted in follow-up work on 193 feeders. All follow-up work has been completed. The Utility initiated quality control patrols to identify temporary construction issues (e.g., insufficient cover, improper use of a jumper) on all active hardening feeder projects.

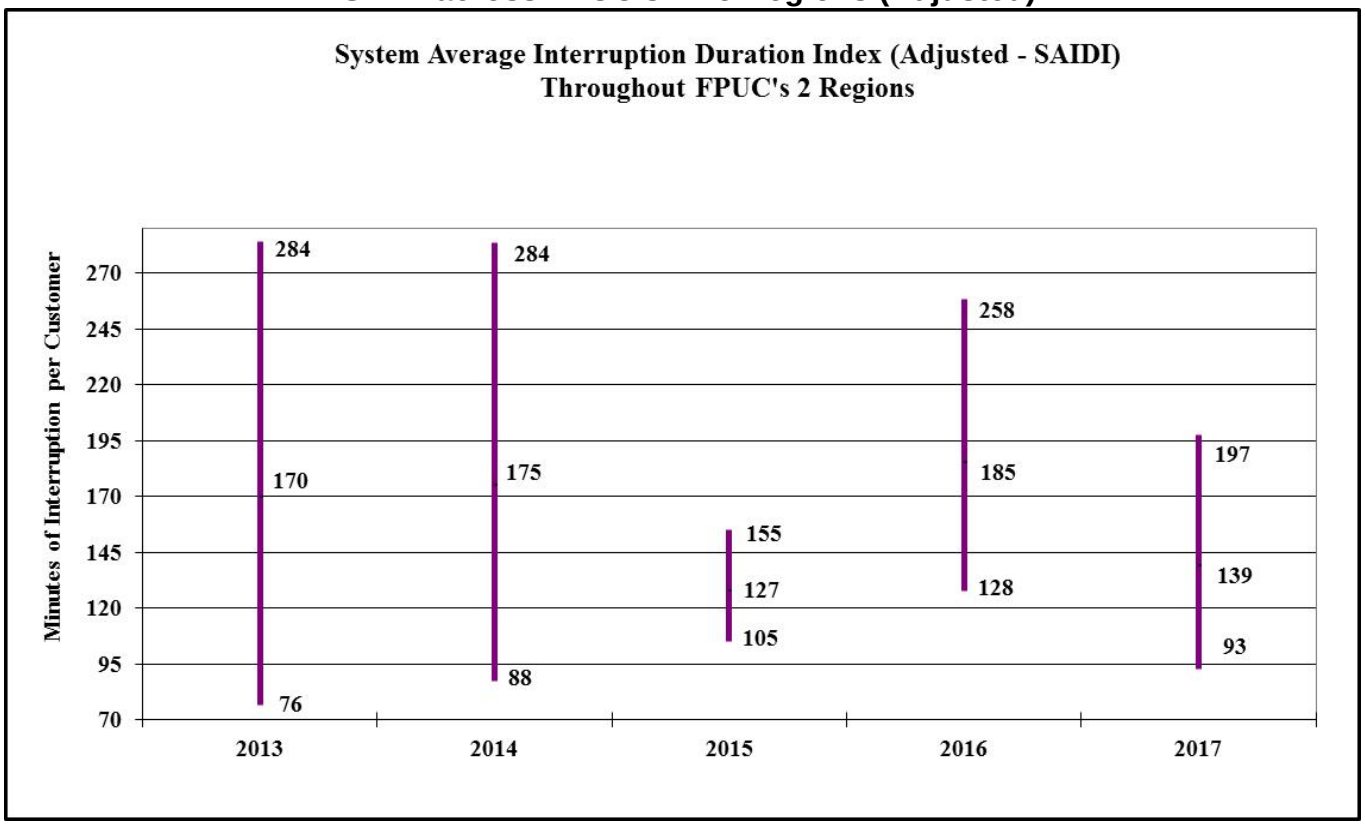
FPL has initiated a targeted undergrounding program to help improve reliability on its system. This program is a three-year pilot converting the worst performing lateral circuits to underground laterals and is scheduled to begin in 2018. As the pilot program continues, FPL will test assumptions and obtain experience. FPL estimates it will convert 280 overhead laterals throughout its service territory. FPL provided an overview of its targeted undergrounding program at the Commission's Internal Affairs meeting on August 7, 2018. Staff will continue to monitor FPL's targeted underground program and report on the progress.

Florida Public Utilities Company: Adjusted Data

FPUC has two electric divisions, the Northwest division, also referred to as Marianna and the Northeast division, also referred to as Fernandina Beach. Each division's result is reported separately because the two divisions are 250 miles apart and not directly interconnected. Although the divisions may supply resources to support one another during emergencies, each division has diverse situations to contend with, making it difficult to compare the division's results and form a conclusion as to response and restoration time.

Figure 3-17 shows the highest, average, and lowest adjusted SAIDI values recorded by FPUC's system. The data shows the average SAIDI index is trending downward for the five-year period of 2013 to 2017 and there was a 25 percent decrease from 2016 to 2017.

Figure 3-17.
SAIDI across FPUC's Two Regions (Adjusted)



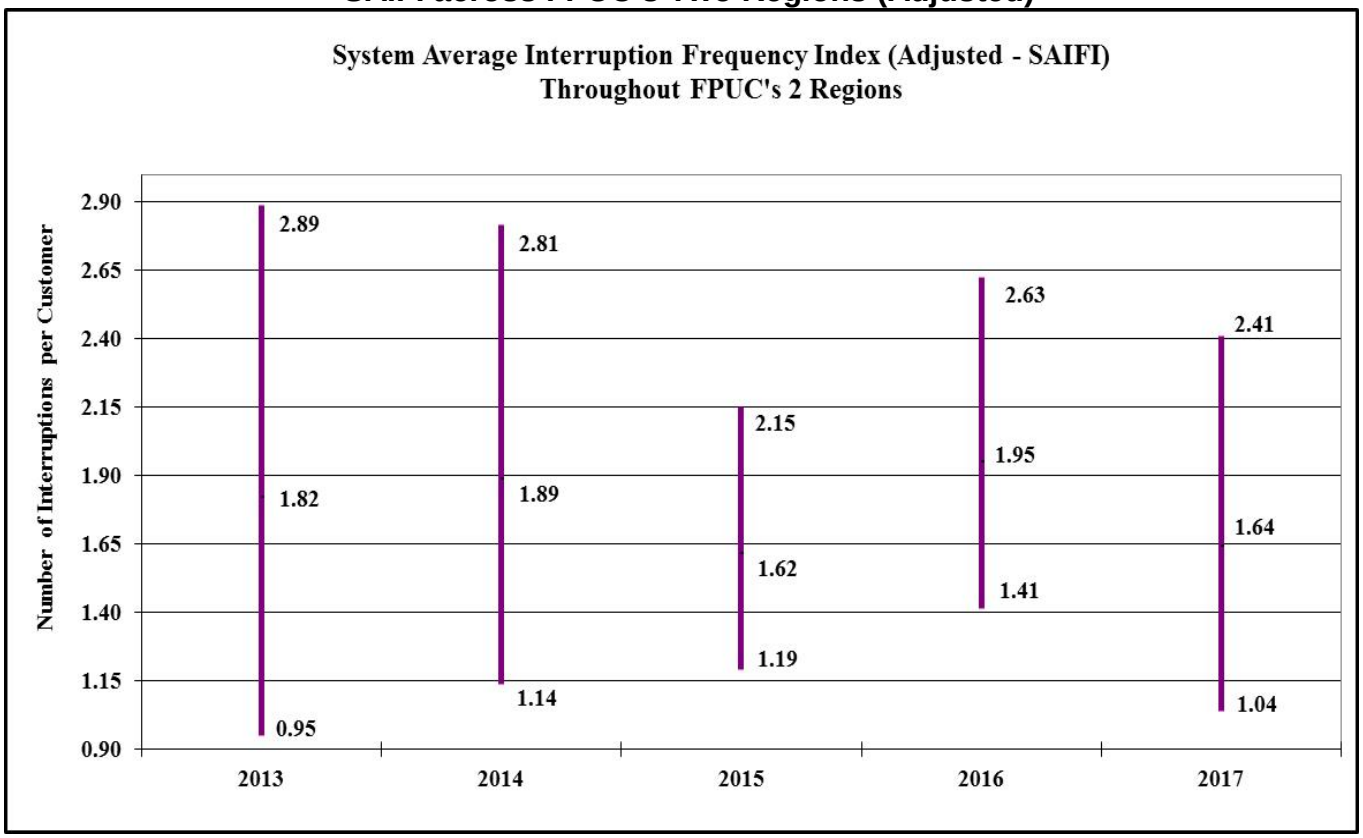
FPUC's Regions with the Highest and Lowest Adjusted SAIDI Distribution Reliability Performance by Year

	2013	2014	2015	2016	2017
Highest SAIDI	Marianna (NW)	Marianna (NW)	Marianna (NW)	Marianna (NW)	Marianna (NW)
Lowest SAIDI	Fernandina(NE)	Fernandina(NE)	Fernandina(NE)	Fernandina(NE)	Fernandina(NE)

Source: FPUC's 2013-2017 distribution service reliability reports.

Figure 3-18 shows the adjusted SAIFI across FPUC's two divisions. The data depicts a 16 percent decrease in the 2017 average SAIFI reliability index from 2016. The data for the average and maximum SAIFI values are trending downward as the minimum SAIFI value is trending upward over the five-year period of 2013 to 2017.

Figure 3-18.
SAIFI across FPUC's Two Regions (Adjusted)



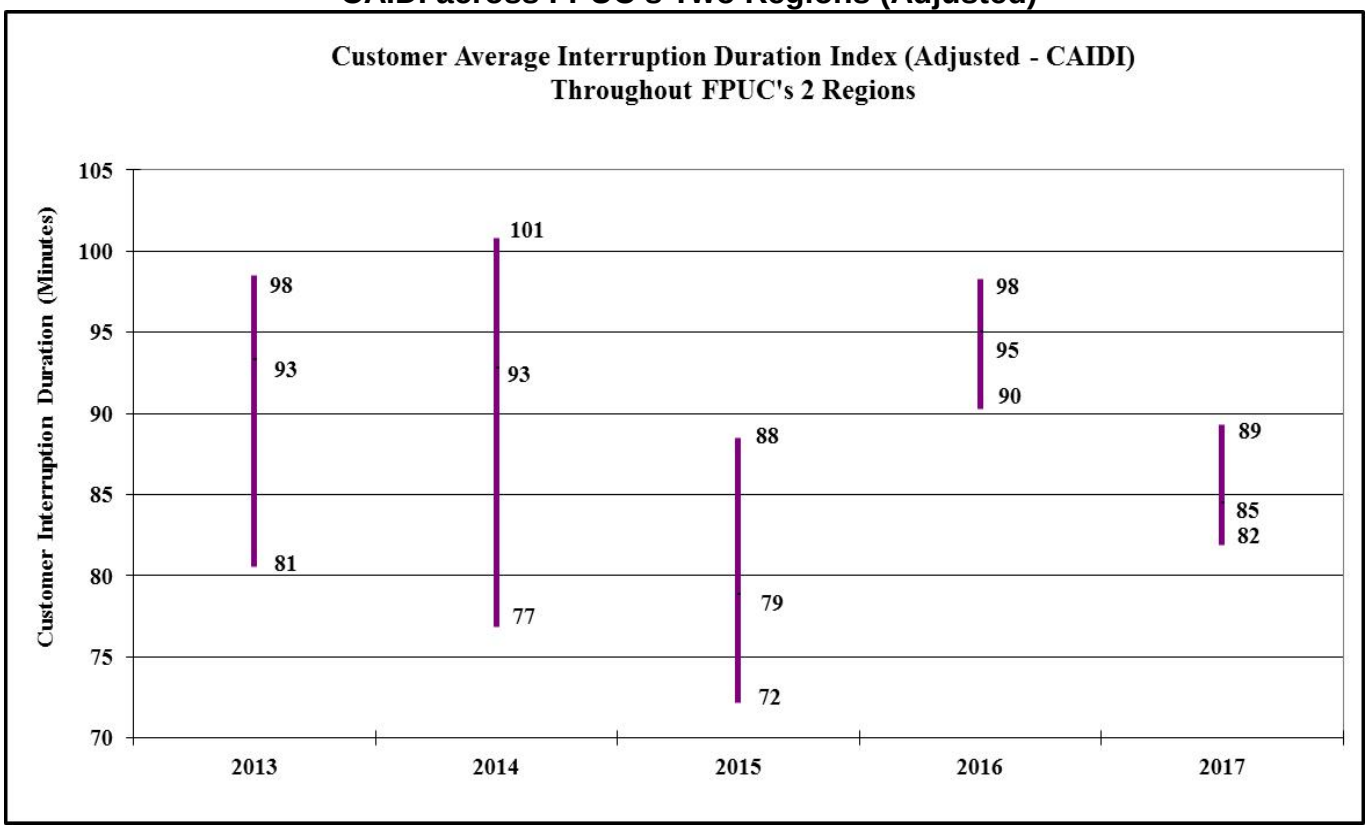
FPUC's Regions with the Highest and Lowest Adjusted SAIFI Distribution Reliability Performance by Year

	2013	2014	2015	2016	2017
Highest SAIFI	Marianna (NW)	Marianna (NW)	Marianna (NW)	Marianna (NW)	Marianna (NW)
Lowest SAIFI	Fernandina(NE)	Fernandina(NE)	Fernandina(NE)	Fernandina(NE)	Fernandina(NE)

Source: FPUC's 2013-2017 distribution service reliability reports.

Figure 3-19 shows the highest, average, and lowest adjusted CAIDI values across FPUC's system. FPUC's data shows the average CAIDI value decreased by 11 percent for 2017 (85 minutes) when compared to 2016 (95 minutes). For the past five years, the maximum, the minimum, and the average CAIDI values are trending downward.

Figure 3-19.
CAIDI across FPUC's Two Regions (Adjusted)



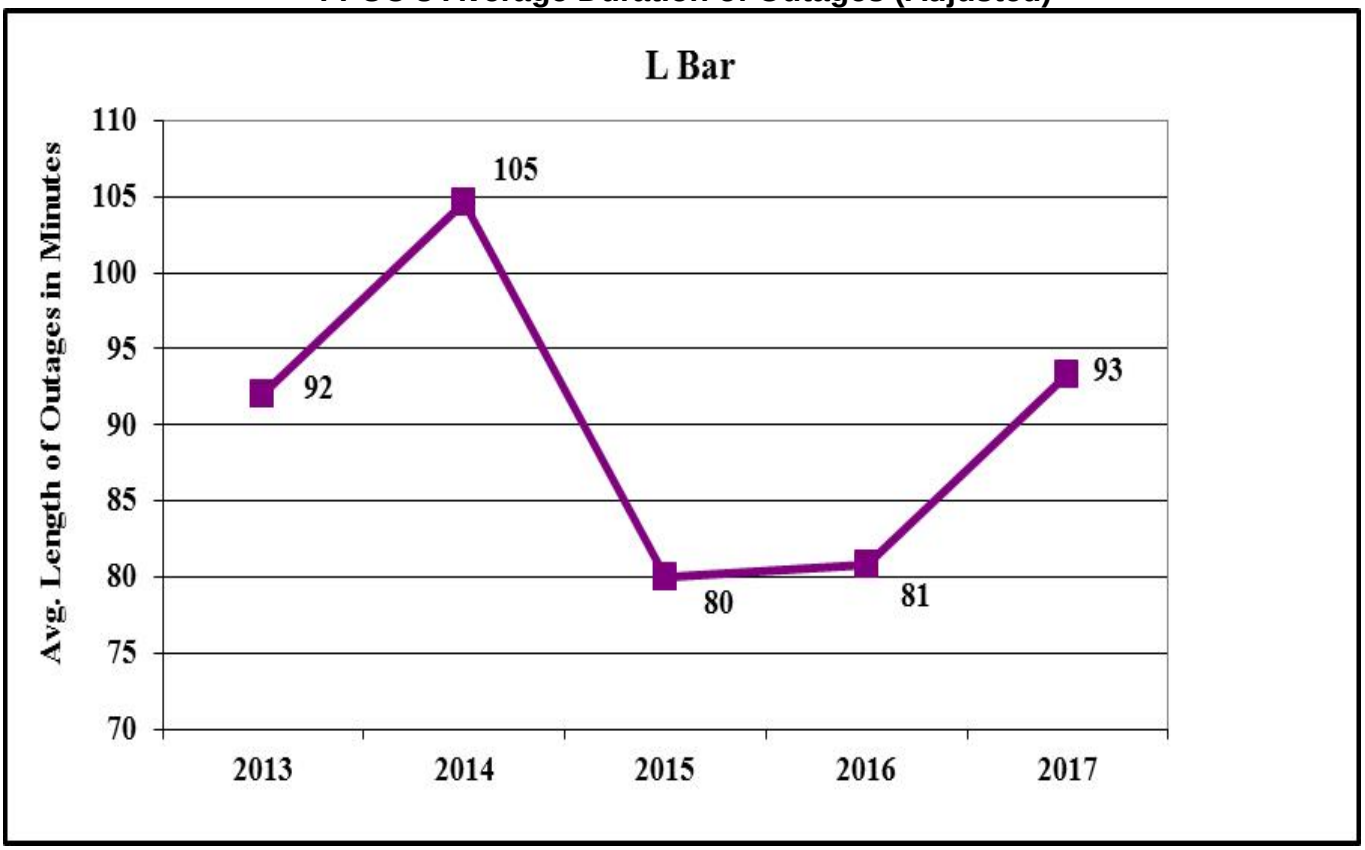
FPUC's Regions with the Highest and Lowest Adjusted CAIDI Distribution Reliability Performance by Year

	2013	2014	2015	2016	2017
Highest CAIDI	Marianna (NW)	Marianna (NW)	Fernandina(NE)	Marianna (NW)	Fernandina(NE)
Lowest CAIDI	Fernandina(NE)	Fernandina(NE)	Marianna (NW)	Fernandina(NE)	Marianna (NW)

Source: FPUC's 2013-2017 distribution service reliability reports.

Figure 3-20 is the average length of time FPUC spends recovering from outage events (adjusted L-Bar). There was a 13 percent increase in the L-Bar value from 2016 to 2017. The data for the five-year period of 2013 to 2017 suggests that the L-Bar index is trending downward indicating FPUC is taking less time to restore service after an outage event.

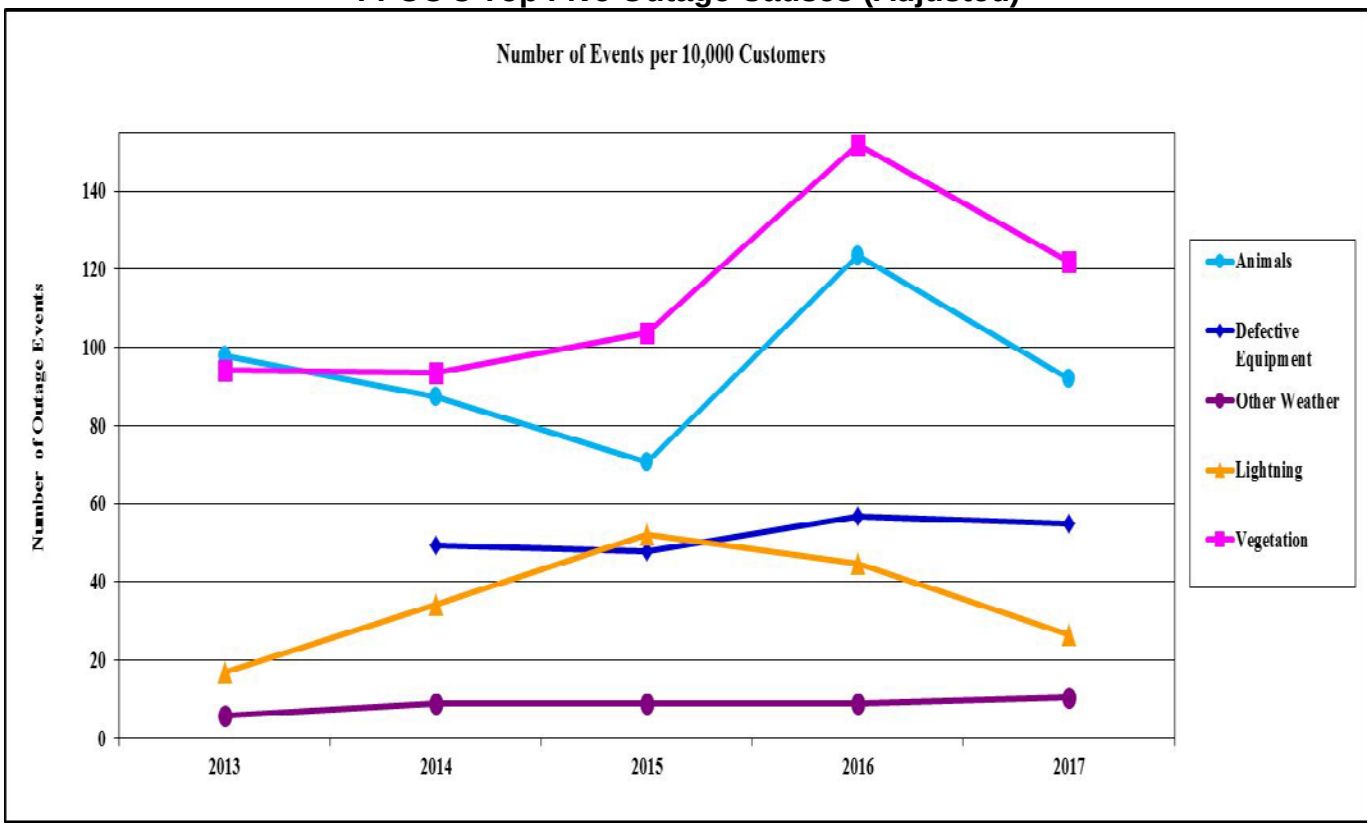
Figure 3-20.
FPUC's Average Duration of Outages (Adjusted)



Source: FPUC's 2013-2017 distribution service reliability reports.

Figure 3-21 shows the top five causes of outage events on FPUC's distribution system normalized to a 10,000-customer base. The figure is based on FPUC's adjusted data of the top 10 causes of outages. For 2017, the top five causes of outage events were Vegetation (31 percent), Animals (23 percent), Defective Equipment (14 percent), Other Weather (13 percent), and Lightning (7 percent). These five factors represent 88 percent of the total adjusted outage causes in 2017. The cause by Lightning is trending upward even though there was a 26 percent decrease from 2016 to 2017. The causes by Defective Equipment, Animals, and Vegetation are also trending upward. Defective Equipment increased 18 percent from 2016 to 2017. The Animals and Vegetation category decreased 7 percent and 18 percent during the same time period, respectively. The Other Weather category caused outages has remained relatively flat over the five-year period of 2013 to 2017, even though there was a 21 percent increase from 2016 to 2017. Beginning with 2014, the Defective Equipment category now includes outage categories that in the past were separately identified.

Figure 3-21.
FPUC's Top Five Outage Causes (Adjusted)



Source: FPUC's 2013-2017 distribution service reliability reports.

FPUC filed a Three Percent Feeder Report listing the top 3 percent of feeders with the outage events for 2017. FPUC has so few feeders that the data in the report has not been statistically significant. There were two feeders on the Three Percent Feeder Report, one in each division. Neither of these feeders was listed on the report for the last five years.

Observations: FPUC's Adjusted Data

The SAIDI, SAIFI, and CAIDI average indices have all decreased compared to 2016. For the five-year period of 2013 to 2017, the average indices for SAIDI, SAIFI, CAIDI and L-Bar are trending downward. FPUC reported that it continues to invest in its storm hardening initiatives, infrastructure improvements, and system upgrades in both divisions. FPUC believes this will generate reliability improvements in the future. The Utility reviewed its five-year reliability indicator trends, averages and outage causes and determined the reliability indexes continue to be significantly influenced by weather.

To improve its reliability, in 2018, FPUC is planning to implement a new lateral protection strategy by installing cutout-mounted recloser units. This program deploys Tripsaver cutout mounted reclosers on the worst laterals in the last three years. The Tripsaver recloser works the same as an electronic recloser but for a smaller number of customers. The reclosers offer protection to upstream customers by giving a utility the ability to isolate faults and shorten the outage time experienced by customers.

In addition, to help mitigate the situation with vegetation caused outages, FPUC suggests that its vegetation management would be more efficient if it trimmed all of the laterals associated with the feeders at the same time. This would allow FPUC to keep the trim crews in same general area instead of moving them to a different feeder or lateral. This vegetation management schedule has been started in several locations. To help mitigate the situation with animal caused outages, FPUC plans to continue to implement the standard practice of installing animal guards and covering riser wire between the cutout, arrester and transformer. In addition, if metal brackets are in use, they will be replaced with fiberglass brackets to help control animal related outages. FPUC reported that the deployment of the Tripsavers should also help with animal related outages.

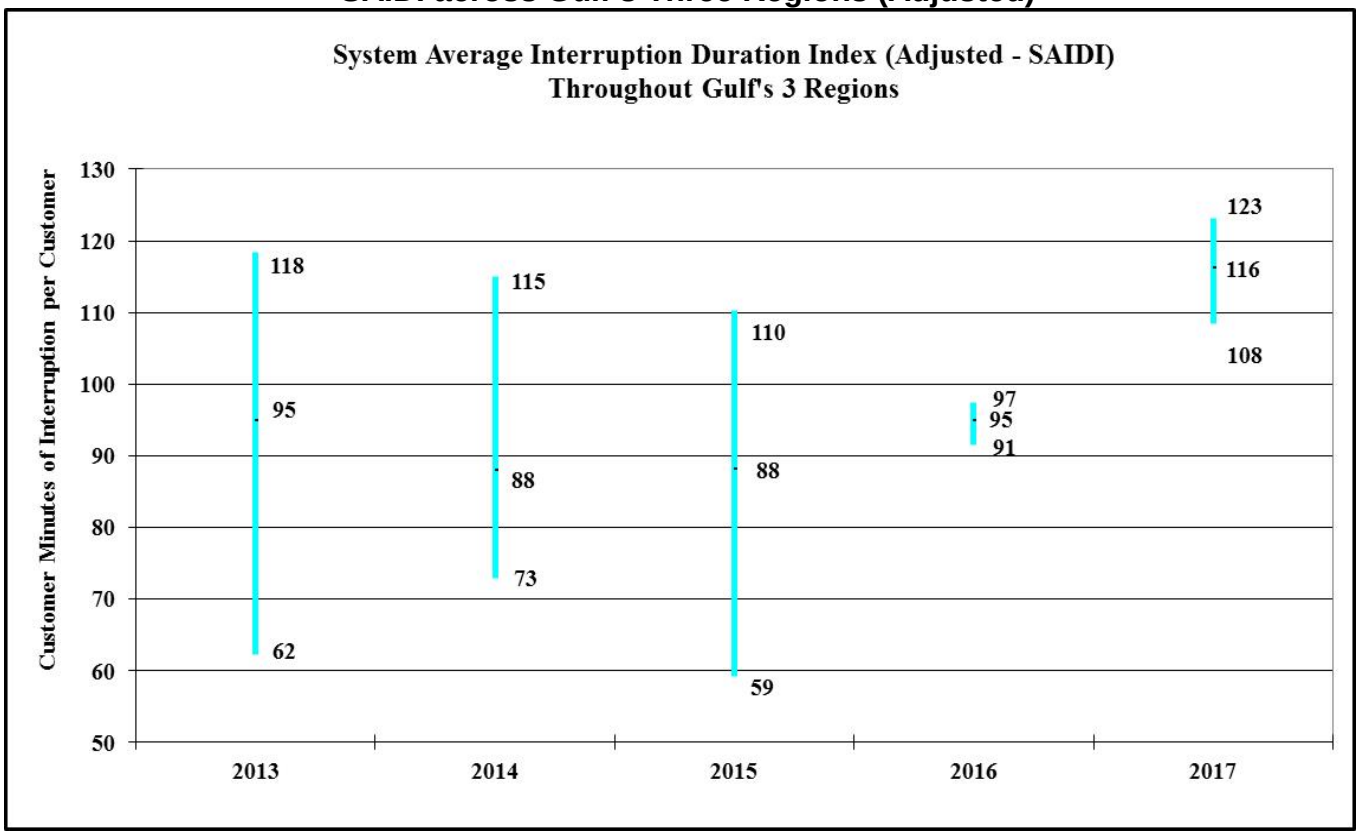
FPUC does not have to report MAIFIe or CEMI5 because Rule 25-6.0455, F.A.C., waives the requirement. The cost for the information systems necessary to measure MAIFIe and CEMI5 has a higher impact on small utilities compared to large utilities on a per customer basis.

Gulf Power Company: Adjusted Data

Gulf's service area includes much of the Florida panhandle and covers approximately 7,550 square miles in eight Florida counties – Bay, Escambia, Holmes, Jackson, Okaloosa, Santa Rosa, Walton, and Washington. This geographic area is divided into three districts known as the Western, Central, and Eastern. The district distribution metrics and overall distribution system metrics are presented in the following figures.

Figure 3-22 illustrates Gulf's SAIDI minutes, or the interruption duration minutes on a system basis. The chart depicts an 18 percent increase in the average SAIDI in Gulf's combined regions when compared to the 2016 results. Gulf's 2017 average performance was 116 minutes compared to 95 minutes in 2016. The highest SAIDI value for the past three years has been in the Western district as the Central and Eastern districts have the best or lowest SAIDI values. The maximum SAIDI index is continuing to trend downward even with an increase in 2017, as the minimum and average SAIDI indices are trending upward.

Figure 3-22.
SAIDI across Gulf's Three Regions (Adjusted)



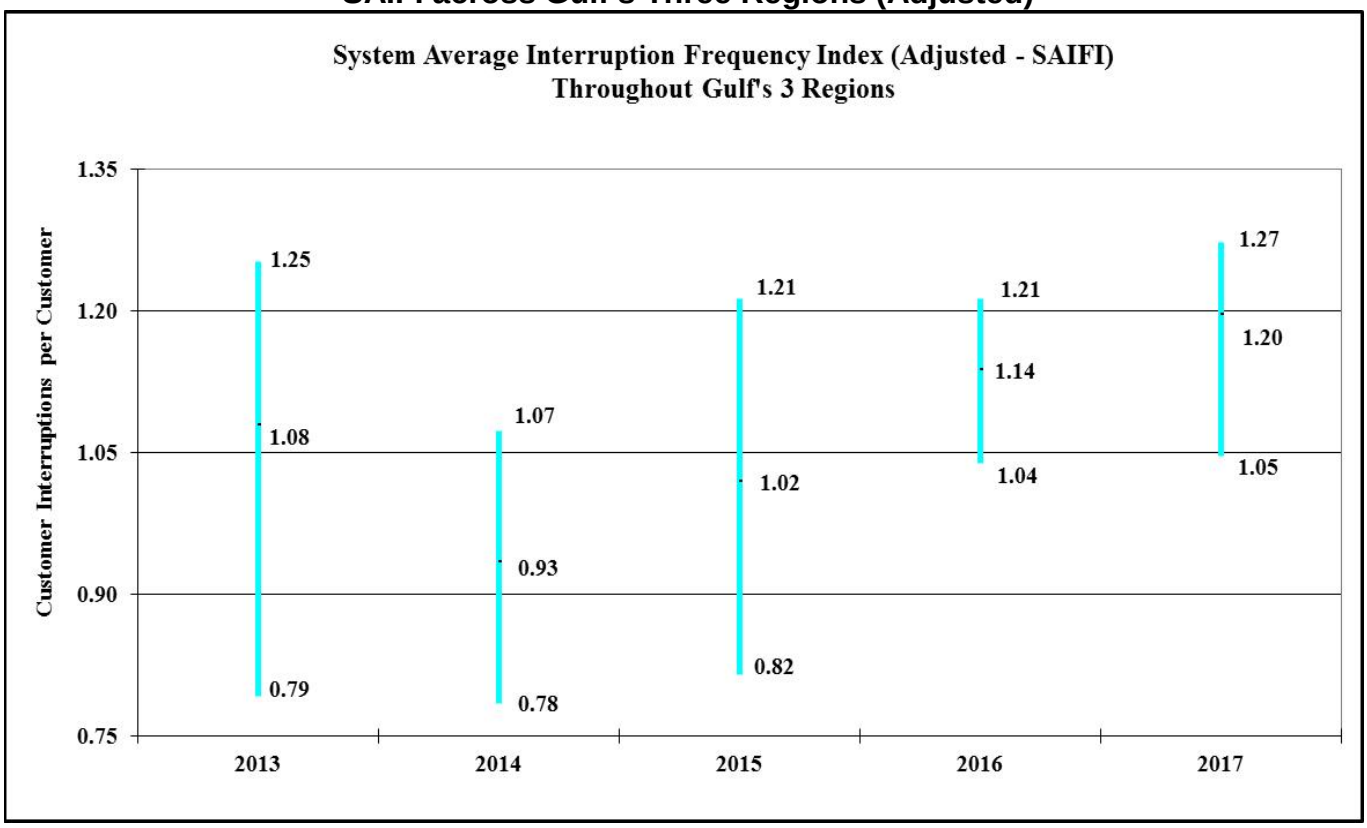
Gulf's Regions with the Highest and Lowest Adjusted SAIDI Distribution Reliability Performance by Year

	2013	**2014**	**2015**	**2016**	2017
Highest SAIDI	Eastern	Central	Western	Western	Western
Lowest SAIDI	Central	Eastern	Eastern	Central	Eastern

Source: Gulf's 2013-2017 distribution service reliability reports.

Figure 3-23 illustrates that Gulf's SAIFI had a 5 percent increase in 2017 when compared to 2016. The highest SAIFI value for the past five years has fluctuated between the three regions. The lowest values appear to fluctuate between the Central region and the Eastern region. The maximum, average, and minimum SAIFI values appear to be trending upward.

Figure 3-23.
SAIFI across Gulf's Three Regions (Adjusted)



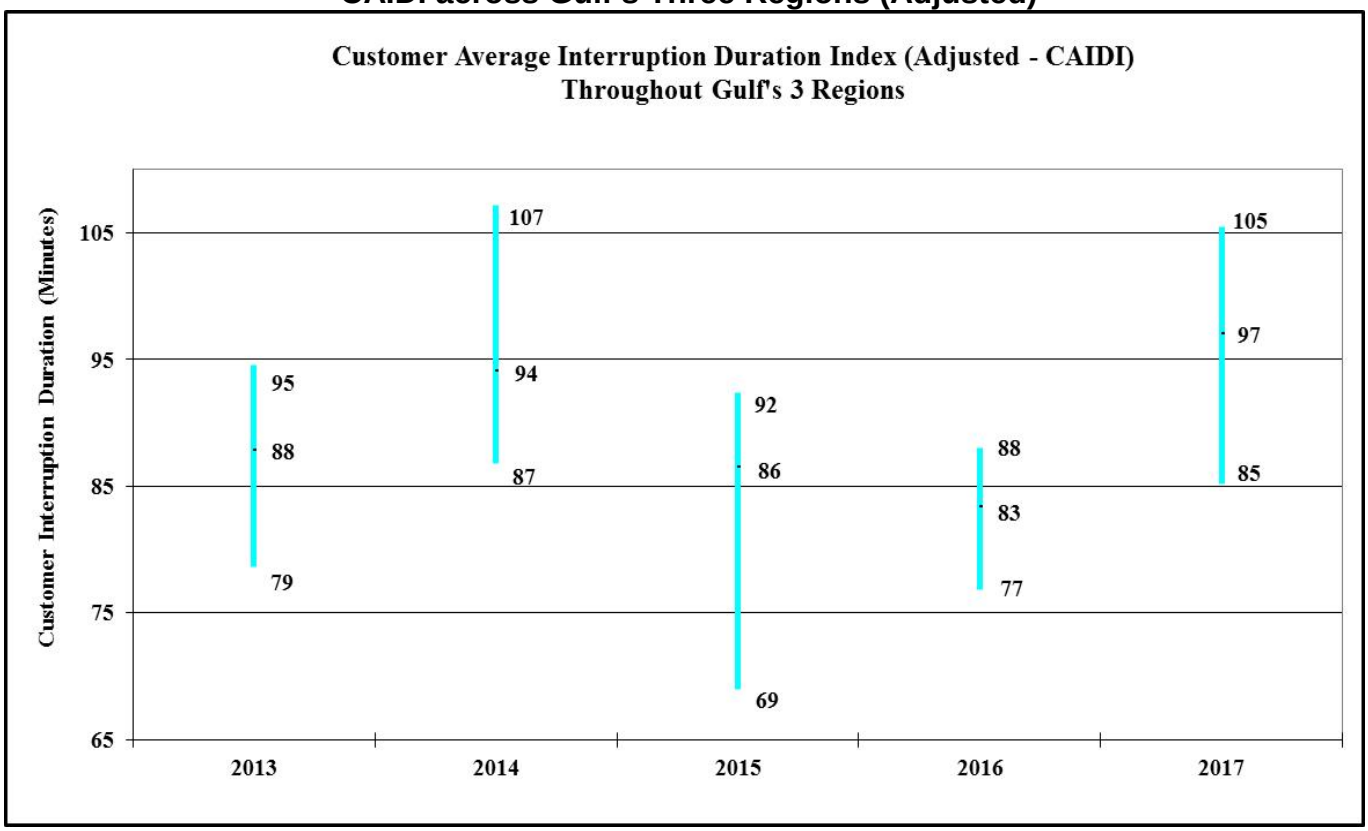
Gulf's Regions with the Highest and Lowest Adjusted SAIFI Distribution Reliability Performance by Year

	2013	2014	2015	2016	2017
Highest SAIFI	Eastern	Central	Western	Eastern	Eastern
Lowest SAIFI	Central	Eastern	Central	Central	Central

Source: Gulf's 2013-2017 distribution service reliability reports.

Figure 3-24 is Gulf's adjusted CAIDI. For 2017, the average CAIDI is 97 minutes and represents a 14 percent increase from the 2016 value of 83 minutes. In 2017, the Central region had the highest CAIDI value, as the Eastern region had the lowest CAIDI. Staff notes that the average, the maximum and the minimum CAIDI values are trending upward.

Figure 3-24.
CAIDI across Gulf's Three Regions (Adjusted)



Gulf's Regions with the Highest and Lowest Adjusted CAIDI Distribution Reliability Performance by Year

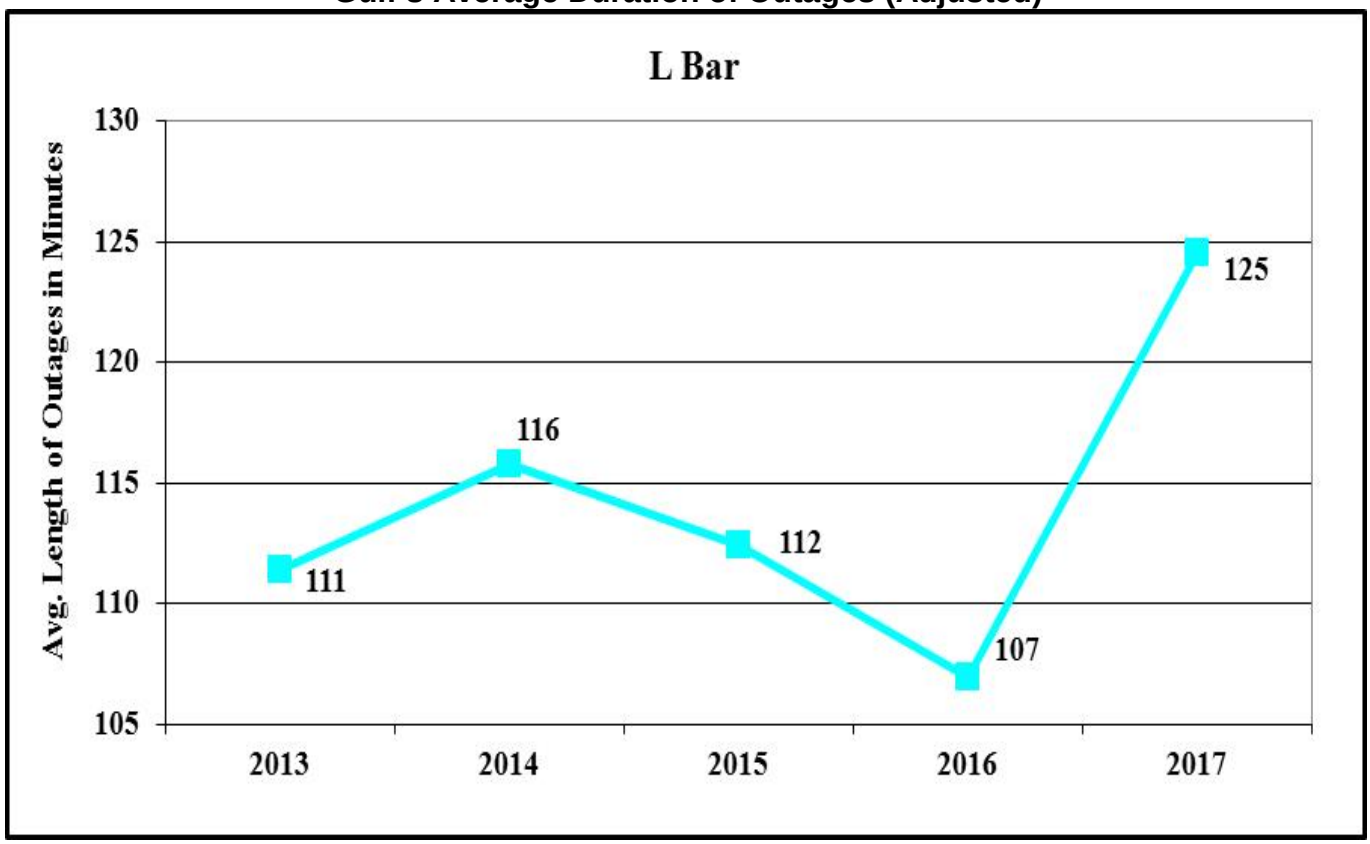
	2013	2014	2015	2016	2017
Highest CAIDI	Eastern	Central	Central	Central	Central
Lowest CAIDI	Central	Western	Eastern	Eastern	Eastern

Source: Gulf's 2013-2017 distribution service reliability reports.

Figure 3-25 illustrates Gulf's L-Bar or the average length of time Gulf spends recovering from outage events, excluding hurricanes and other allowable excluded outage events. Gulf's L-Bar showed a 14 percent increase from 2016 to 2017. The data for the five-year period of 2013 to 2017 shows an upward trend.

Gulf reported that all three of its Districts experienced outages due to three non-excludable severe thunderstorms. These severe thunderstorms occurred on January 1 and 2, 2017, February 7, 2017, and May 1, 2017. During these events, a combined 59,414 customers lost power, primarily due to high wind speeds. Regarding the January 1 and 2, 2017 event, Gulf reported that the average customer outage for the Central district lasted 228 minutes as in the Eastern district, the average outage lasted 45 minutes and in the Western district, the average outage lasted 113 minutes. Gulf reported for the February 7, 2017 event the average customer outage for the Central district was 248 minutes, for the Eastern district was 164 minutes, and for the Western district was 103 minutes. Regarding the May 1, 2017 event, in the Central district, the average customer outage was 107 minutes, in the Eastern district, the average outage was 264 minutes, and in the Western district, the average outage was 241 minutes. Excluding these three events, Gulf did not find that the time to restore power had increased for events associated with normal weather days.

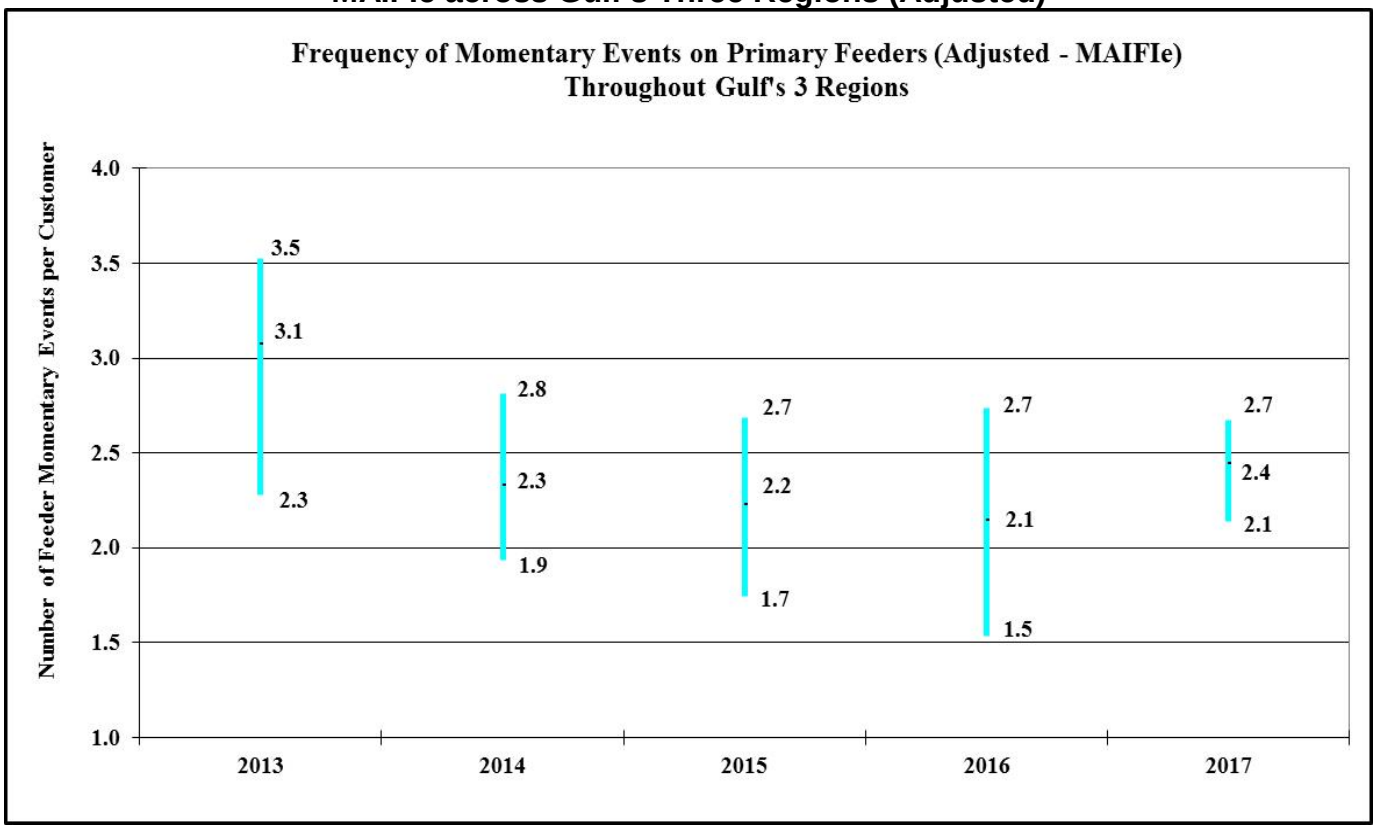
Figure 3-25.
Gulf's Average Duration of Outages (Adjusted)



Source: Gulf's 2013-2017 distribution service reliability reports.

Figure 3-26 is the adjusted MAIFIe recorded across Gulf's system. The adjusted MAIFIe results by region show that the Central region had the lowest frequency of momentary events on primary feeders. The Western region has the highest MAIFIe index in 2017. The average MAIFIe showed a 13 percent decline when compared to 2016. The data suggest that the highest, average, and lowest MAIFIe are all continuing to trend downward, suggesting improvement.

Figure 3-26.
MAIFIe across Gulf's Three Regions (Adjusted)



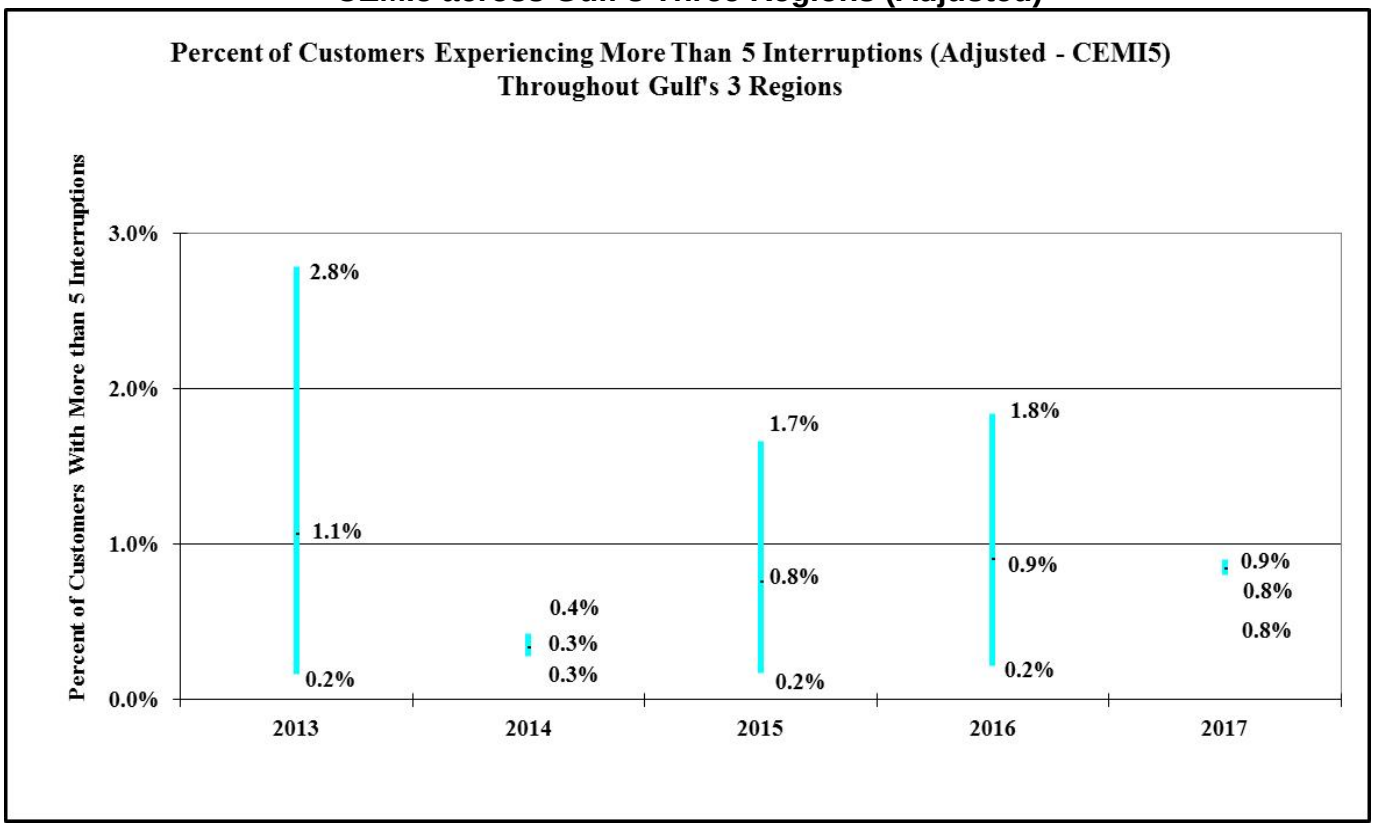
Gulf's Regions with the Highest and Lowest Adjusted MAIFIe Distribution Reliability Performance by Year

	2013	2014	2015	2016	2017
Highest MAIFIe	Western	Central	Western	Western	Western
Lowest MAIFIe	Eastern	Eastern	Eastern	Central	Central

Source: Gulf's 2013-2017 distribution service reliability reports.

Figure 3-27 shows the highest, average, and lowest adjusted CEMI5 across Gulf's Western, Central, and Eastern regions. Gulf's 2017 results illustrate an 11 percent decrease in the average CEMI5 percentage when compared to 2016. The maximum CEMI5 appears to be trending downward over the five-year period of 2013 to 2017, as the average CEMI5 appears to be relativity flat, suggesting that the percentage of Gulf's customers experiencing more than five interruptions is decreasing and improving. The minimum CEMI5 appears to be trending upward for the same period.

Figure 3-27.
CEMI5 across Gulf's Three Regions (Adjusted)



Gulf's Regions with the Highest and Lowest Adjusted CEMI5 Distribution Reliability Performance by Year

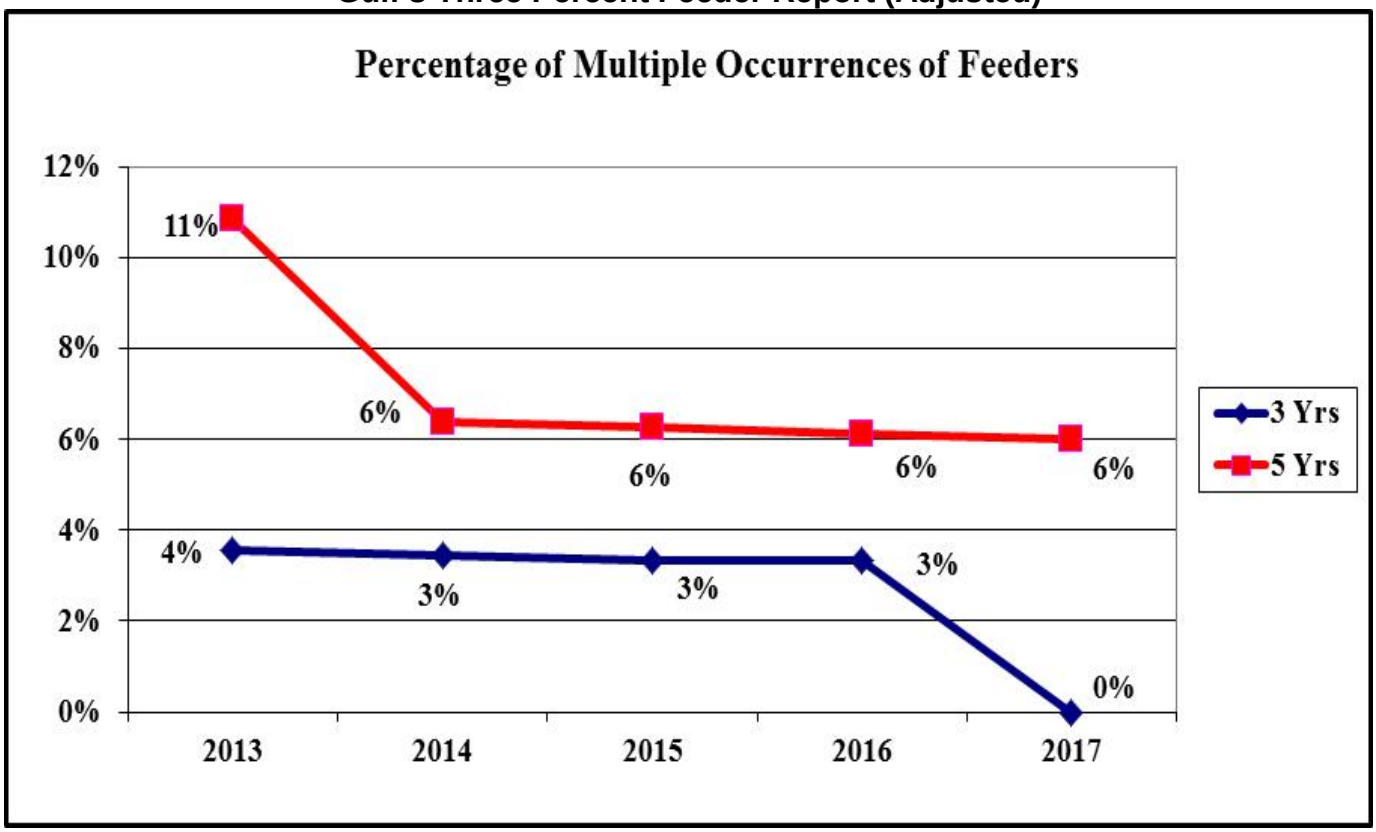
	2013	2014	2015	2016	2017
Highest CEMI5	Eastern	Eastern	Eastern	Eastern	Central
Lowest CEMI5	Central	Western	Central	Central	Western

Source: Gulf's 2013-2017 distribution service reliability reports.

Figure 3-28 shows the multiple occurrences of feeders using the utility's Three Percent Feeder Report and is analyzed on a three- and five-year basis. The Three Percent Feeder Report is a listing of the top three percent of feeders that have the most feeder outage events. The supporting data illustrates that the five-year multiple occurrences did not change from 2016 to 2017 as the three-year multiple occurrences decreased. The five-year period of 2013 to 2017 indicates overall that the five-year index is trending downward, as is the three-year multiple occurrences index.

There were 10 feeders on the Three Percent Feeder Report, which were on the report for the first time within five years. Gulf reported that the three top causes of breaker operations associated with the 10 feeders listed were manual operations, deterioration, and trees. Gulf explained manual operation cause is when Gulf purposefully opens breakers for line crews to work safely during an emergency. Often these outages are created to isolate a dangerous condition or to operate a manual device that could potentially pose a safety hazard to personnel if opened while energized. Gulf has several inspection programs and conductor replacement efforts in place to mitigate deterioration outages. Deterioration includes equipment inside the substation and on the distribution feeder. To mitigate the outages due to vegetation, Gulf is expanding its tree trimming rights with the Right-of-Way Acquisition Pilot in addition to tree trimming and other vegetation management efforts.

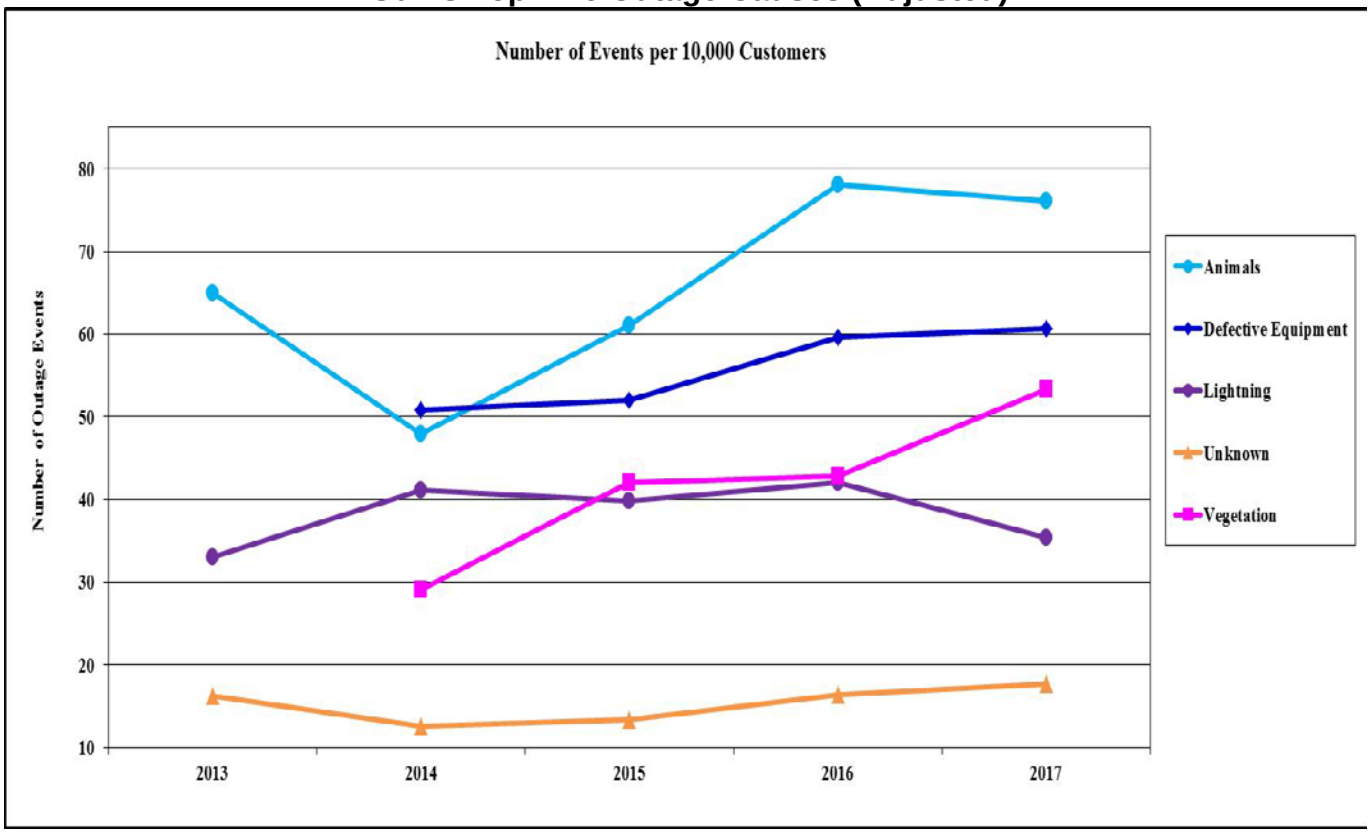
Figure 3-28.
Gulf's Three Percent Feeder Report (Adjusted)



Source: Gulf's 2013-2017 distribution service reliability reports.

Figure 3-29 is a graph of the top five causes of outage events on Gulf's distribution system normalized to a 10,000-customer base. The figure is based on Gulf's adjusted data of the top 10 causes of outage events and represents 91 percent of the total adjusted outage events that occurred during 2017. The top five causes of outage events were Animals (28 percent), Defective Equipment (23 percent), Vegetation (20 percent), Lightning (13 percent), and Unknown Causes (7 percent). The percentage of outages due to Animals was the highest cause of outages. The number of outage events due to Animals is trending upward even though there was a 3 percent decrease in 2017. The numbers of outage events due to Lightning and Unknown causes are slightly trending upward. The number of outages due to Defective Equipment and Vegetation are both trending upward. The Defective Equipment and Vegetation categories now include outage categories that in the past were separately identified. Gulf continues to focus its process improvement efforts on the system wide top outage causes through its existing programs and storm hardening efforts.

Figure 3-29.
Gulf's Top Five Outage Causes (Adjusted)



Source: Gulf's 2013-2017 distribution service reliability reports.

Observations: Gulf's Adjusted Data

There were improvements seen in Gulf's CEMI5 and the Three-Year Percentages of Multiple Feeder Outage events indices in 2017 as the SAIDI, SAIFI, CAIDI, MAIFIe and L-Bar declined. The Five-Year Percentages of Multiple Feeder Outage events had no changes. Overall it appears that the trend lines for the reliability indices for the five-year period of 2013 to 2017 are primarily trending upward.

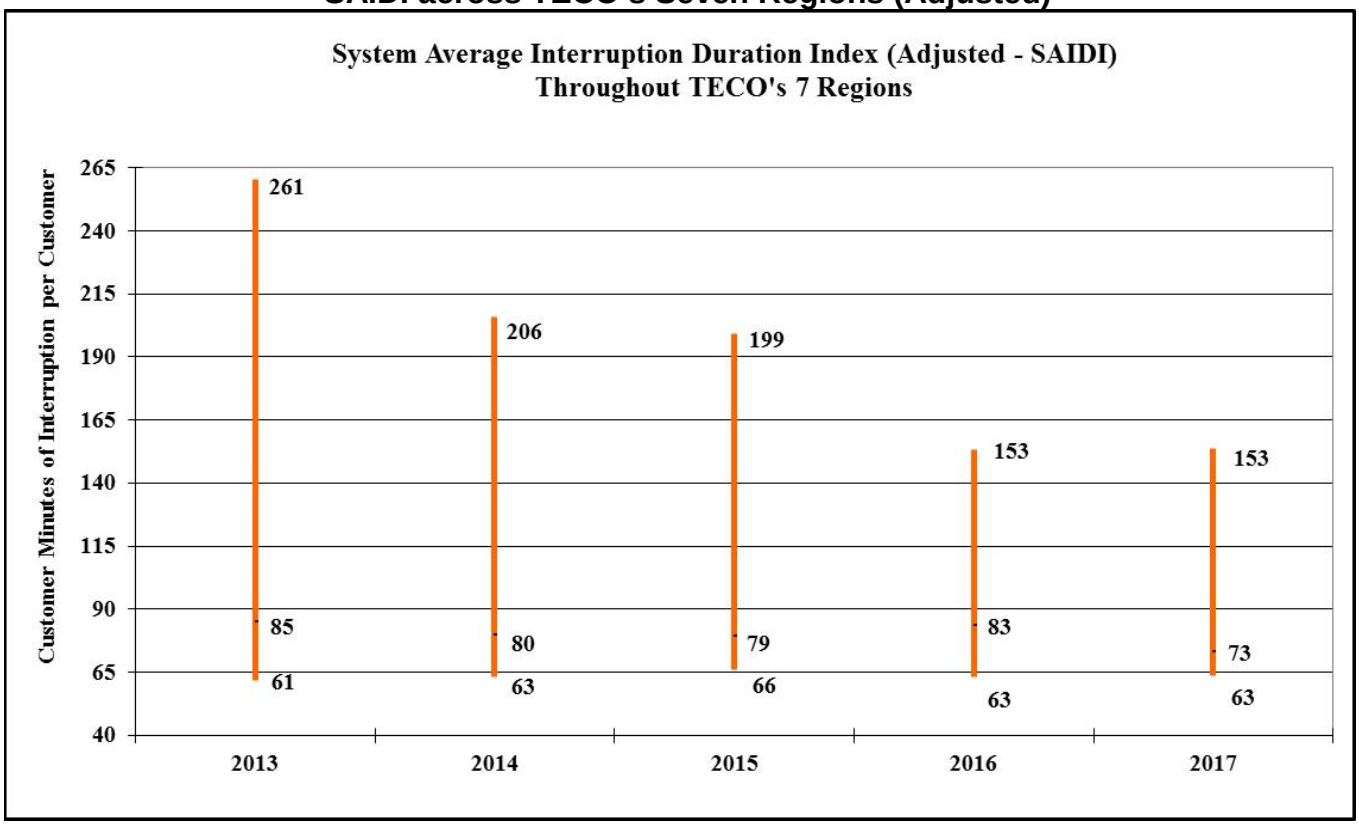
Gulf continues to collect outage data at the customer meter level. The Utility reviews outage data and the resulting reliability indices at the system level and by its three districts. Gulf is analyzing 2017 data to determine the need for any specific improvement opportunities beyond the current programs and storm hardening initiatives. Gulf reported that it continues to seek opportunities to improve system reliability. In 2018, Gulf expanded its conductor replacement program. This program identifies aged or undersized sections of the distribution system and rebuilds them to the latest construction specifications.

Gulf will continue to install additional distribution automation devices to further segment the feeder for outage restoration. These devices protect customers by limiting those affected by temporary faults and sustained outages.

Tampa Electric Company: Adjusted Data

Figure 3-30 shows the adjusted SAIDI values recorded by TECO's system. Five of the seven TECO regions had improvements in SAIDI performance during 2017, with the Eastern region having the lowest SAIDI performance results. The Dade City region continues to have the poorest SAIDI performance results for the five-year period of 2013 to 2017. The lowest SAIDI index for the seven regions appears to be slightly trending upward. The average SAIDI index decreased 12 percent from 2016 to 2017. This index appears to be slightly trending downward. The Central, Eastern, and Winter Haven regions recorded the lowest SAIDI indices for the five-year period. Dade City, Plant City, and South Hillsborough regions have the fewest customers and represent the most rural, lowest customer density per line mile in comparison to the other four TECO divisions.

Figure 3-30.
SAIDI across TECO's Seven Regions (Adjusted)



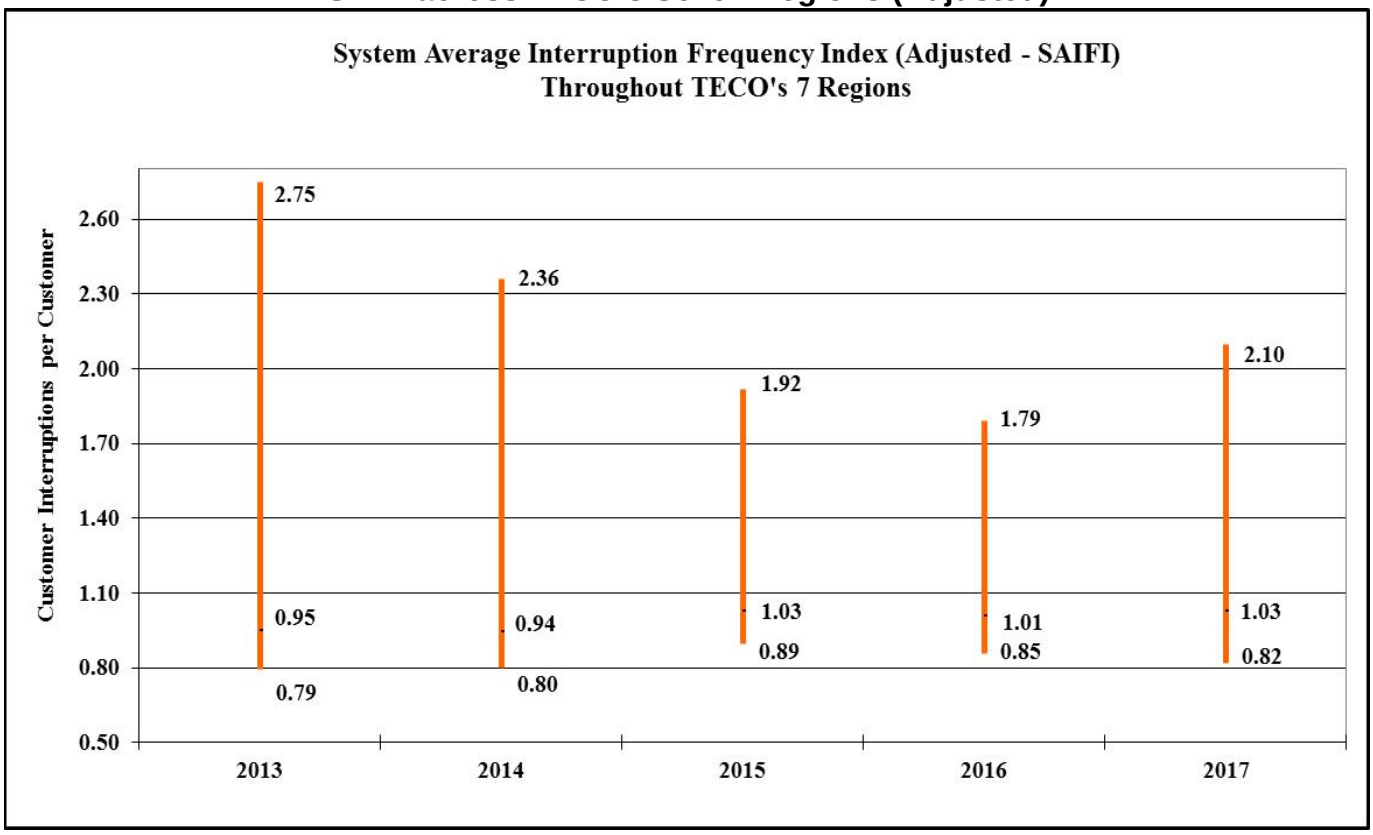
TECO's Regions with the Highest and Lowest Adjusted SAIDI Distribution Reliability Performance by Year

	2013	2014	2015	2016	2017
Highest SAIDI	Dade City	Dade City	Dade City	Dade City	Dade City
Lowest SAIDI	Winter Haven	Central	Winter Haven	Central	Eastern

Source: TECO's 2013-2017 distribution service reliability reports.

Figures 3-31 illustrates TECO's adjusted frequency of interruptions per customer reported by the system. TECO's data represent a 2 percent increase in the SAIFI average from 1.01 interruptions in 2016 to 1.03 interruptions in 2017. TECO's Dade City region continues to have the highest frequency of service interruptions when compared to TECO's other regions. The minimum and average SAIFI are trending upward while the maximum SAIFI is trending downward.

Figure 3-31.
SAIFI across TECO's Seven Regions (Adjusted)



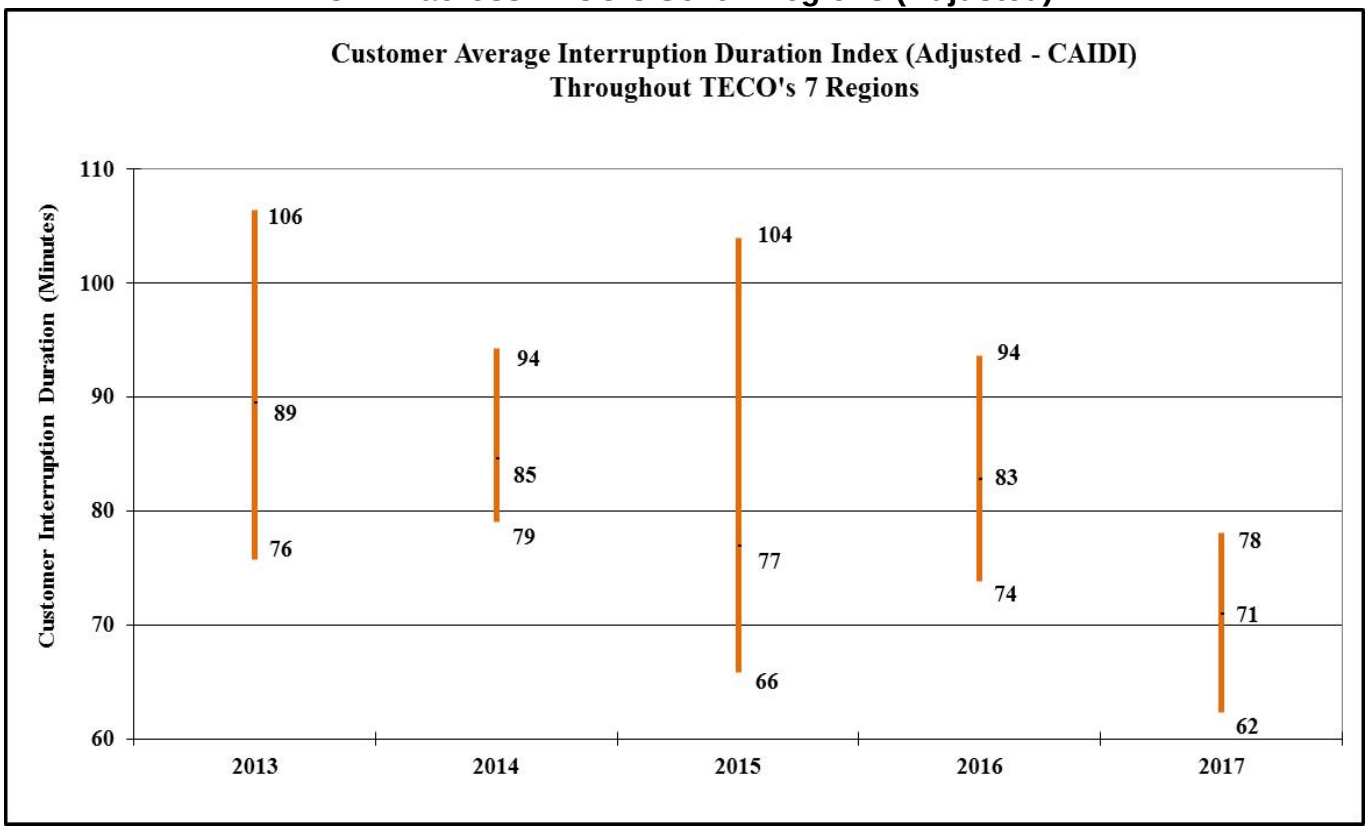
TECO's Regions with the Highest and Lowest Adjusted SAIFI Distribution Reliability Performance by Year

	2013	2014	2015	2016	2017
Highest SAIFI	Dade City	Dade City	Dade City	Dade City	Dade City
Lowest SAIFI	Central	Central	Western	Central	Central

Source: TECO's 2013-2017 distribution service reliability reports.

Figure 3-32 charts the length of time that a typical TECO customer experiences an outage, which is known as CAIDI. The highest CAIDI minutes appear to be confined to the Dade City, Eastern, Plant City, and Western regions. Winter Haven and Central regions have had the lowest (best) results for the last five years. The average CAIDI is trending downward at this time suggesting TECO's customers are experiencing shorter outages and there was a 14 percent decrease in the average CAIDI when comparing 2016 to 2017.

Figure 3-32.
CAIDI across TECO's Seven Regions (Adjusted)



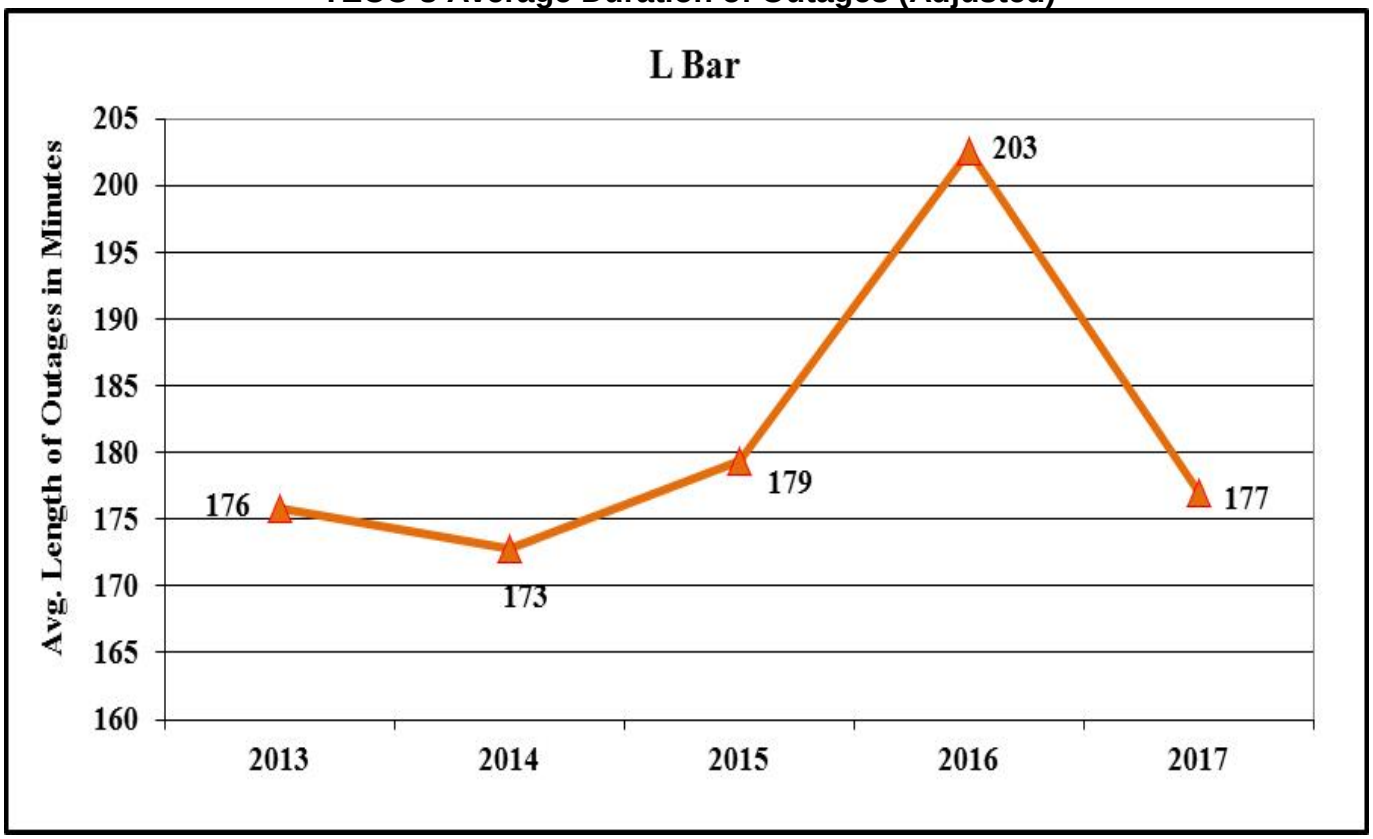
TECO's Regions with the Highest and Lowest Adjusted CAIDI Distribution Reliability Performance by Year

	2013	2014	2015	2016	2017
Highest CAIDI	Eastern	Western	Dade City	Plant City	Central
Lowest CAIDI	Winter Haven	Central	Central	Central	Winter Haven

Source: TECO's 2013-2017 distribution service reliability reports.

Figure 3-33 denotes a 13 percent decrease in outage durations for the period from 2016 to 2017 for TECO. The average length of time TECO spends restoring service to its customers affected by outage events, excluding hurricanes and other allowable excluded outage events is shown in the L-Bar index. The L-Bar index continues to be trending upward for the five-year period of 2013 to 2017, suggesting longer restoral times.

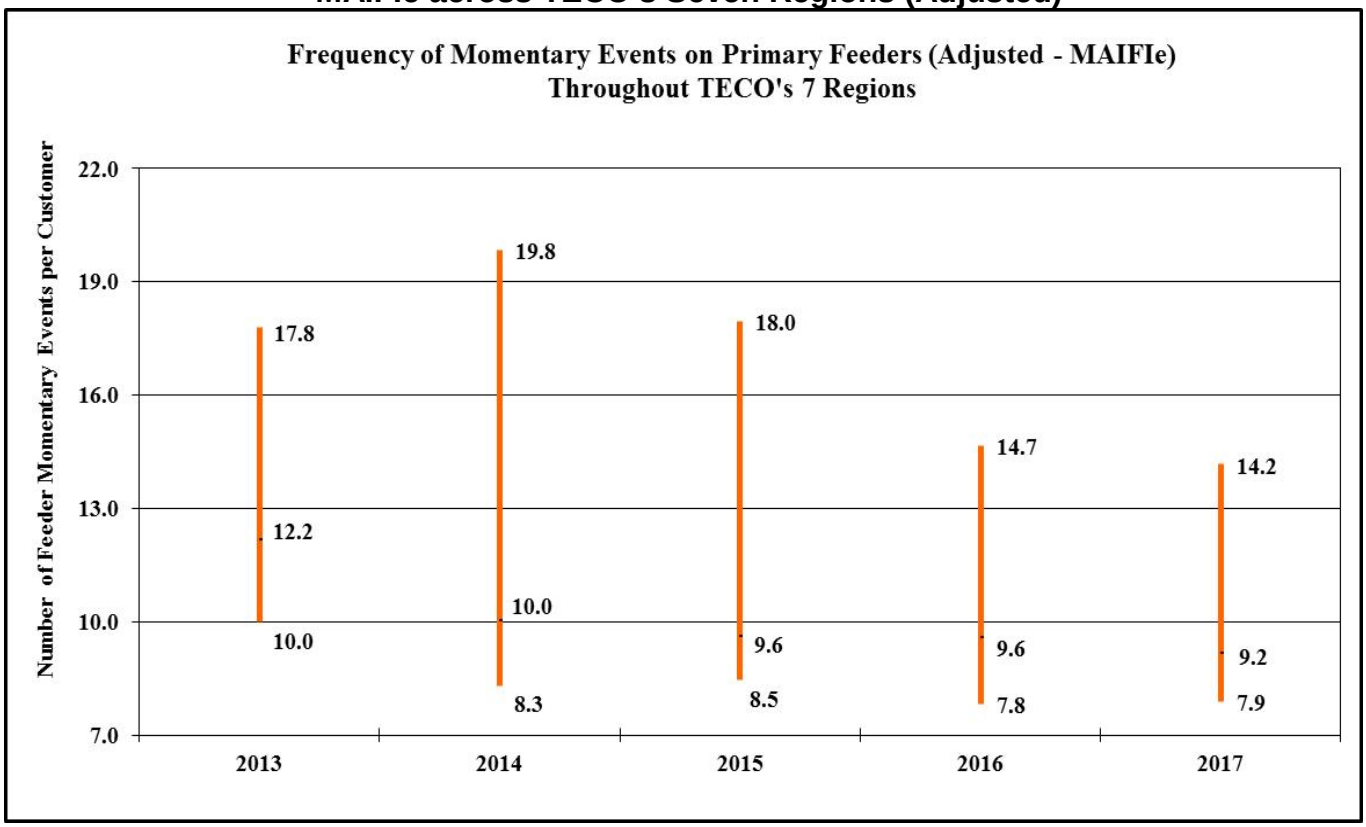
Figure 3-33.
TECO's Average Duration of Outages (Adjusted)



Source: TECO's 2013-2017 distribution service reliability reports.

Figure 3-34 illustrates TECO's number of momentary events on primary circuits per customer recorded across its system. In 2017, the MAIFIe performance improved over the 2016 results in all regions except Central and Winter Haven. The average MAIFIe decreased by 4 percent from 2016 to 2017. **Figure 3-34** shows that the average MAIFIe is trending downward, which suggest an improvement in performance over the five-year period of 2013 to 2017.

Figure 3-34.
MAIFIe across TECO's Seven Regions (Adjusted)



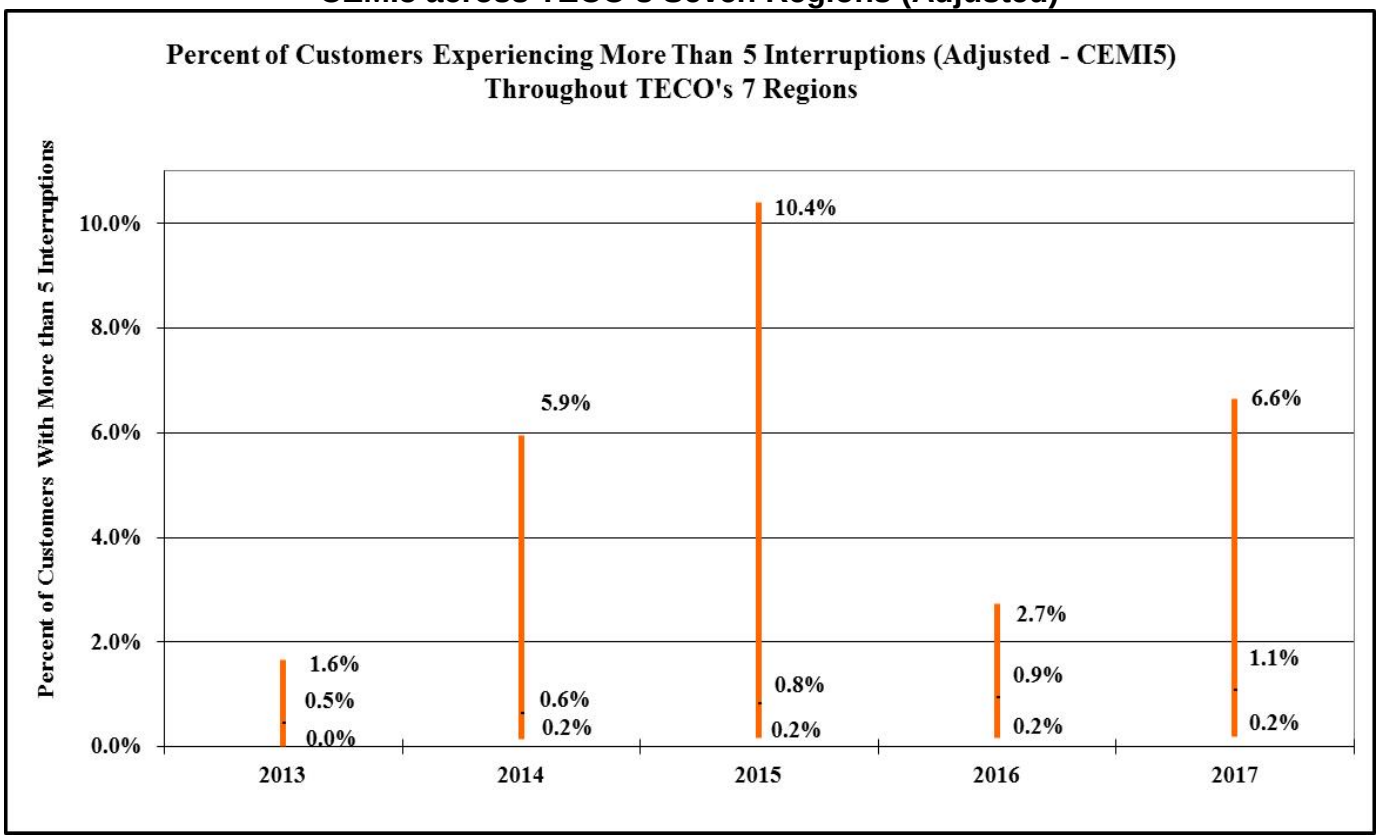
TECO's Regions with the Highest and Lowest Adjusted MAIFIe Distribution Reliability Performance by Year

	2013	2014	2015	2016	2017
Highest MAIFIe	Plant City	Dade City	Dade City	Dade City	Dade City
Lowest MAIFIe	Central	Central	Central	Central	Central

Source: TECO's 2013-2017 distribution service reliability reports.

Figure 3-35 shows the percent of TECO's customers experiencing more than five interruptions. Three regions in TECO's territory experienced a decrease in the CEMI5 results for 2017. The Dade City, Eastern, Plant City, and South Hillsborough regions experienced an increase in the CEMI5 index. Dade City reported the highest CEMI5 percentage for 2017. With TECO's results for this index varying for the past five years, the average CEMI5 index appears to be trending upward indicating a decline in performance. There was an 18 percent increase in the average CEMI5 index from 2016 to 2017.

Figure 3-35.
CEMI5 across TECO's Seven Regions (Adjusted)



TECO's Regions with the Highest and Lowest Adjusted CEMI5 Distribution Reliability Performance by Year

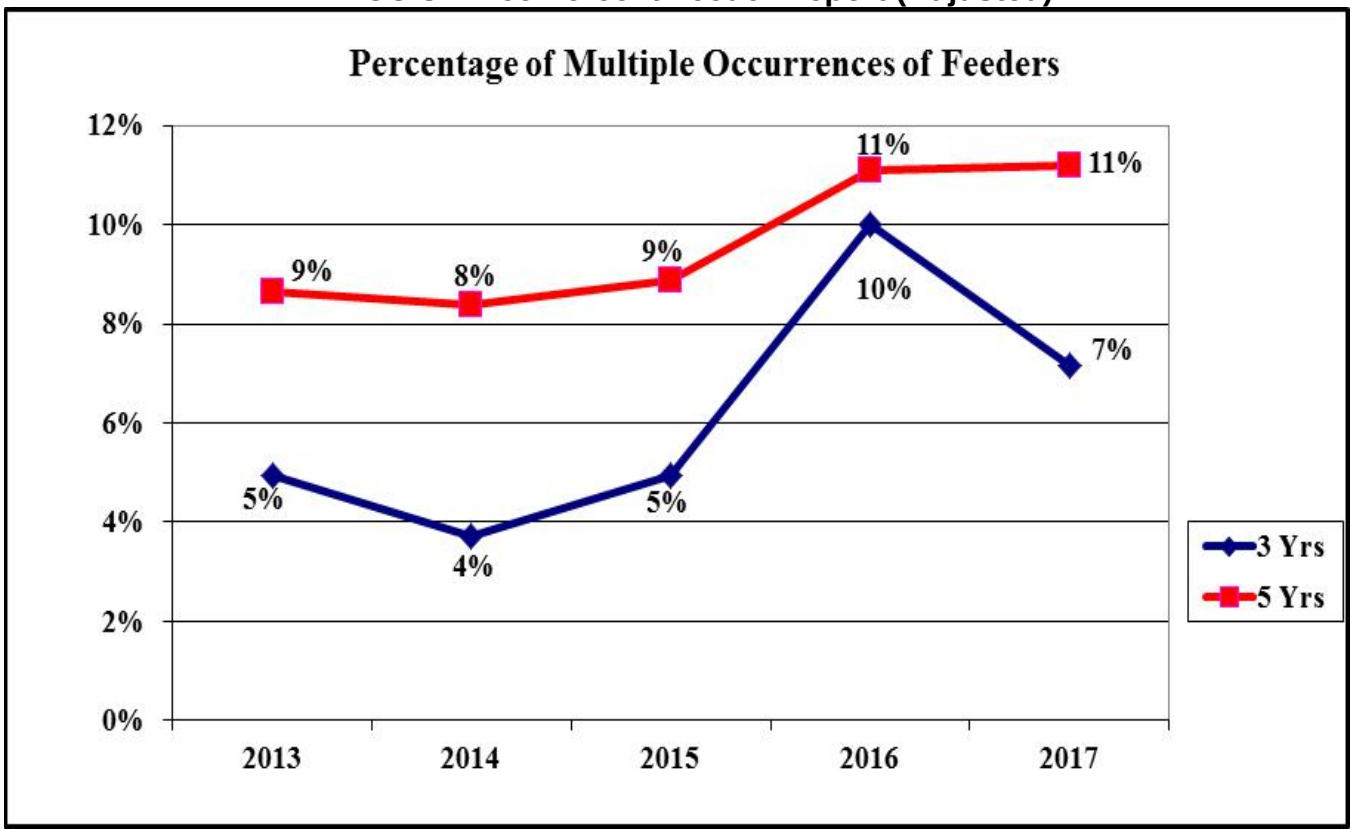
	2013	2014	2015	2016	2017
Highest CEMI5	Plant City	Dade City	Dade City	Dade City	Dade City
Lowest CEMI5	Winter Haven	Western	Winter Haven	South Hillsborough	Central

Source: TECO's 2013-2017 distribution service reliability reports.

Figure 3-36 represents an analysis of TECO's top 3 percent of problem feeders that have reoccurred (appeared on the Three Percent Feeder Report) on a five-year and three-year basis. The graph is developed using the number of recurrences divided by the number of feeders reported. The five-year average of outages per feeder did not change from 2016 to 2017 and the three-year average of outages decreased from 10 percent in 2016 to 7 percent in 2017. Both the five-year average of outages per feeder and the three-year average of outages appear to be still trending upward for the five-year period of 2013 to 2017.

Staff notes that there was one feeder on the Three Percent Feeder Report for the last two years consecutively. Four circuit outages were reported for this feeder in 2017. The causes for the outages varied from Animals to Defective Equipment. In 2017, the corrective action undertaken by TECO included replacing fault indicators, removing bird nest debris, and installing avian protection. TECO stated that it will continue to monitor circuit outage performance as part of its daily and ongoing review of system reliability and will respond accordingly at a regional level.

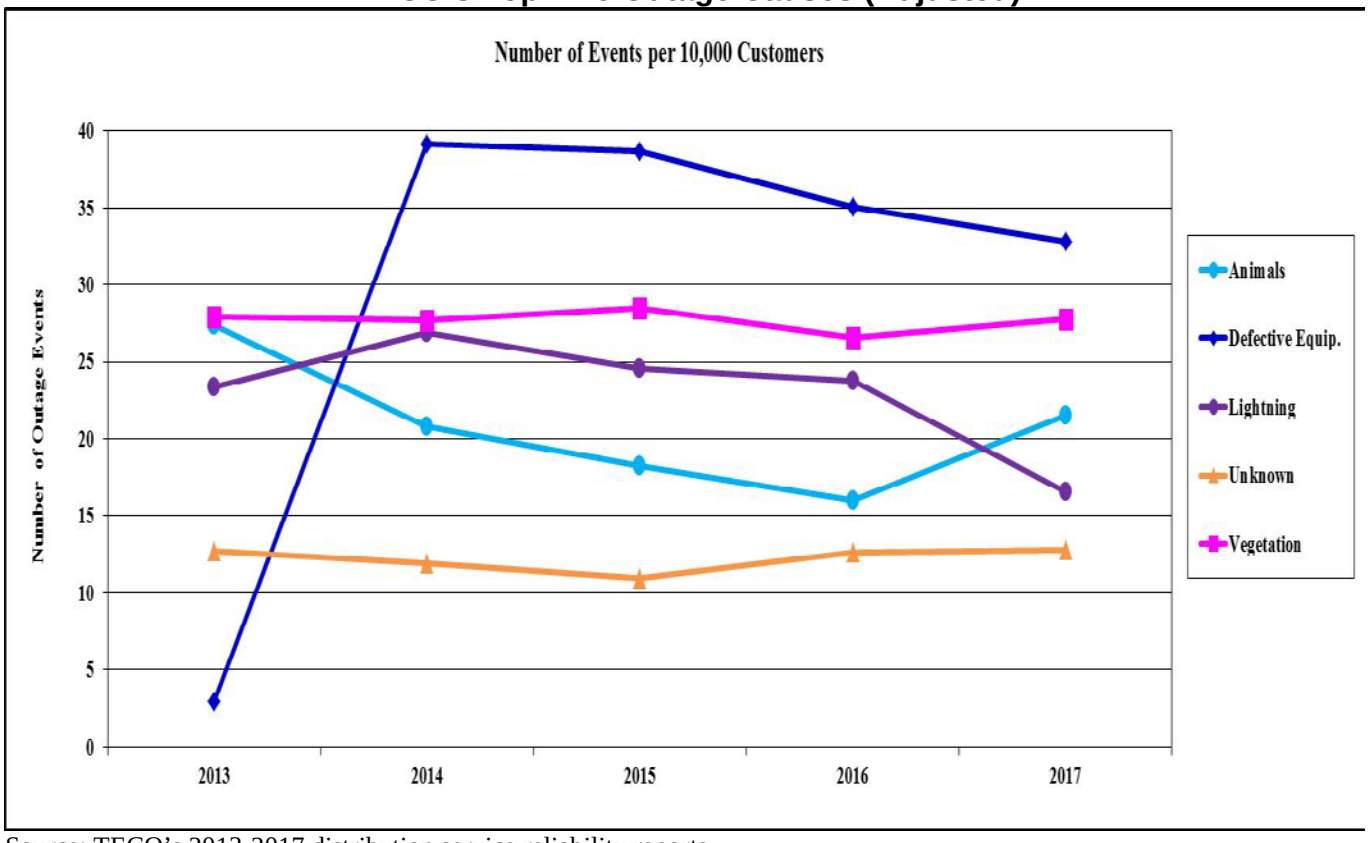
Figure 3-36.
TECO's Three Percent Feeder Report (Adjusted)



Source: TECO's 2013-2017 distribution service reliability reports.

Figure 3-37 shows the top five causes of outage events on TECO's distribution system normalized to a 10,000-customer base. The figure is based on TECO's adjusted data of the top 10 causes of outage events and represents 89 percent of the total outage events that occurred during 2017. For the five-year period, the five top causes of outage events included Defective Equipment (26 percent), Vegetation (22 percent), Animals (17 percent), Lightning (13 percent), and Unknown Causes (10 percent) on a cumulative basis. Defective Equipment is the highest cause of outages for 2017. Beginning in 2014, the Defective Equipment category now includes outage categories that in the past were separately identified. Vegetation and Animals causes are the next two top problem areas for TECO. The outages due to Vegetation increased 7.1 percent from 2016 to 2017. The outages from Lightning decreased 28 percent for the same time period. The numbers of outages due to Lightning and Animals causes are trending downward while the number of outages due to Vegetation and Unknown are remaining relatively flat. The number of outages due to Defective Equipment is trending upward.

Figure 3-37.
TECO's Top Five Outage Causes (Adjusted)



Source: TECO's 2013-2017 distribution service reliability reports.

Observations: TECO's Adjusted Data

Three of TECO's 2017 reliability indices, SAIDI, CAIDI, and MAIFIe, showed an improvement in performance compared to 2016. For the five-year period of 2013 to 2017, the indices for SAIFI, CEMI5, L-Bar, the Three-Year Percent of Multiple Feeder outage events, and the Five-Year Percent of Multiple Feeder outage events are all trending upward. The indices for SAIDI, CAIDI and MAIFIe are trending downward. TECO reported the improvement in SAIDI, CAIDI, and L-Bar were attributed to less severe weather events combined with much quicker restoration times. TECO clarified that the less severe weather events were referring to non-excludable weather as compared to previous years. In addition, TECO explained that the main reason it was able to achieve quicker restoration times that help with the improvements to SAIDI, CAIDI, and L-Bar, was the installation of mid-point feeder/circuit reclosers which allows the Distribution System Operators to restore service to customers more quickly. MAIFIe's improvement was due to fewer breaker operations. The increases in SAIFI and CEMI-5 were contributed to an increased number of outages experienced in 2017 as compared to 2016.

In 2017, the Dade City region had the highest reliability indices in four of the five indices although Dade City did improve in two of the five indices. TECO has implemented the following measures to improve reliability in this region: installed 2 electronic reclosers and 34 TripSaver reclosers. The reclosers offer protection to upstream customers by giving TECO the ability to isolate faults and shorten the outage time experienced by customers. For 2018, TECO has already analyzed and will enhance the fuse coordination protection settings at an additional 87 locations. In addition, the Utility will install 7 more new electronic reclosers and 47 more TripSaver reclosers to help improve the reliability in the Dade City region.

Section IV: Inter-Utility Reliability Comparisons

Section IV contains comparisons of the utilities' adjusted data for the various reliability indices that were reported. It also contains a comparison of the service reliability related complaints received by the Commission.

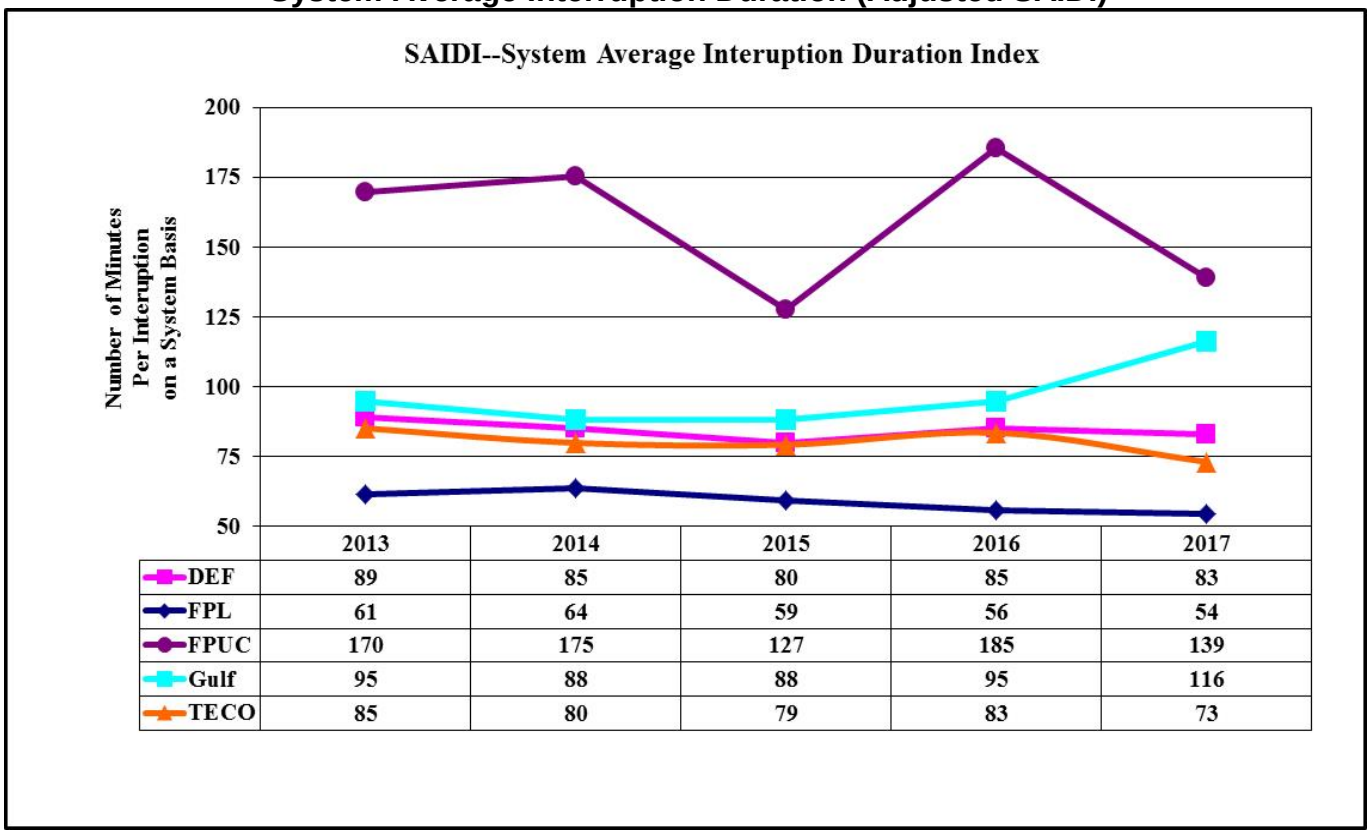
Inter-Utility Reliability Trend Comparisons: Adjusted Data

The inter-utility trend comparison focuses on a graphical presentation that combines all of the IOUs' distribution reliability indices for the years 2013 to 2017. **Figures 4-1** through **4-3** apply to all five utilities while **Figures 4-4** and **4-5** do not apply to FPUC because it is not required to report MAIFIe and CEMI5 due to the size of its customer base. The adjusted data is used in generating the indices in this report and is based on the exclusion of certain events allowed by Rule 25-6.0455(4), F.A.C. Generalizations can be drawn from the side-by-side comparisons; however, any generalizations should be used with caution due to the differing sizes of the distribution systems, the degree of automation, and the number of customers. The indices are unique to each IOU.

Figure 4-1 indicates that Gulf's SAIDI trend has risen since 2013, while DEF, FPL, FPUC and TECO are trending downward. Comparing 2016 SAIDI values to 2017 SAIDI indices, all utilities, except Gulf, have improved. Gulf's SAIDI value increased 7 percent from 2016 to 2017. DEF's SAIDI value has decreased 2 percent, FPL decreased 4 percent, FPUC decreased 25 percent, and TECO decreased 12 percent from 2016 to 2017.

SAIDI is the average amount of time a customer is out of service per retail customers served within a specified area of service over a given period. It is determined by dividing the total Customer Minutes of Interruption by total Number of Customers Served for the respective area of service.

Figure 4-1.
System Average Interruption Duration (Adjusted SAIDI)



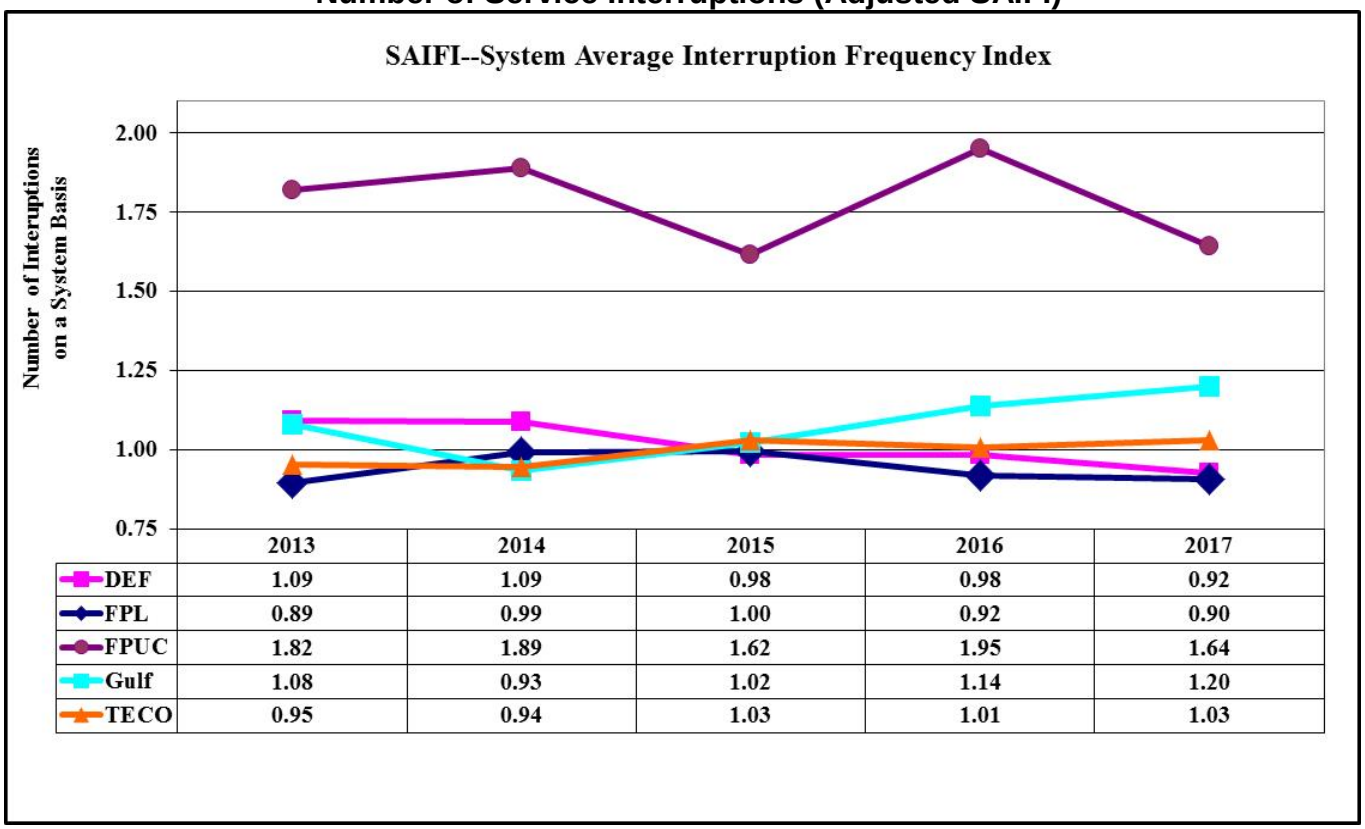
	2013	2014	2015	2016	2017
DEF	89	85	80	85	83
FPL	61	64	59	56	54
FPUC	170	175	127	185	139
Gulf	95	88	88	95	116
TECO	85	80	79	83	73

Source: The IOUs' 2013-2017 distribution service reliability reports.

Figure 4-2 is a five-year graph of the adjusted SAIFI for each IOU. The 2017 data shows DEF, FPL and FPUC's SAIFI values decreased (improved) from the 2016 results as Gulf and TECO's SAIFI values increased. Over the five-year period of 2013 to 2017, Gulf and TECO's SAIFI values are all trending upward. DEF, FPL and FPUC's SAIFI value is trending downward for the period of 2013 to 2017.

SAIFI is the average number of service interruptions per retail customer within a specified area of service over a given period. It is determined by dividing the Sum of Service (aka Customer) Interruptions (CI) by the total Number of Customers Served for the respective area of service.

Figure 4-2.
Number of Service Interruptions (Adjusted SAIFI)



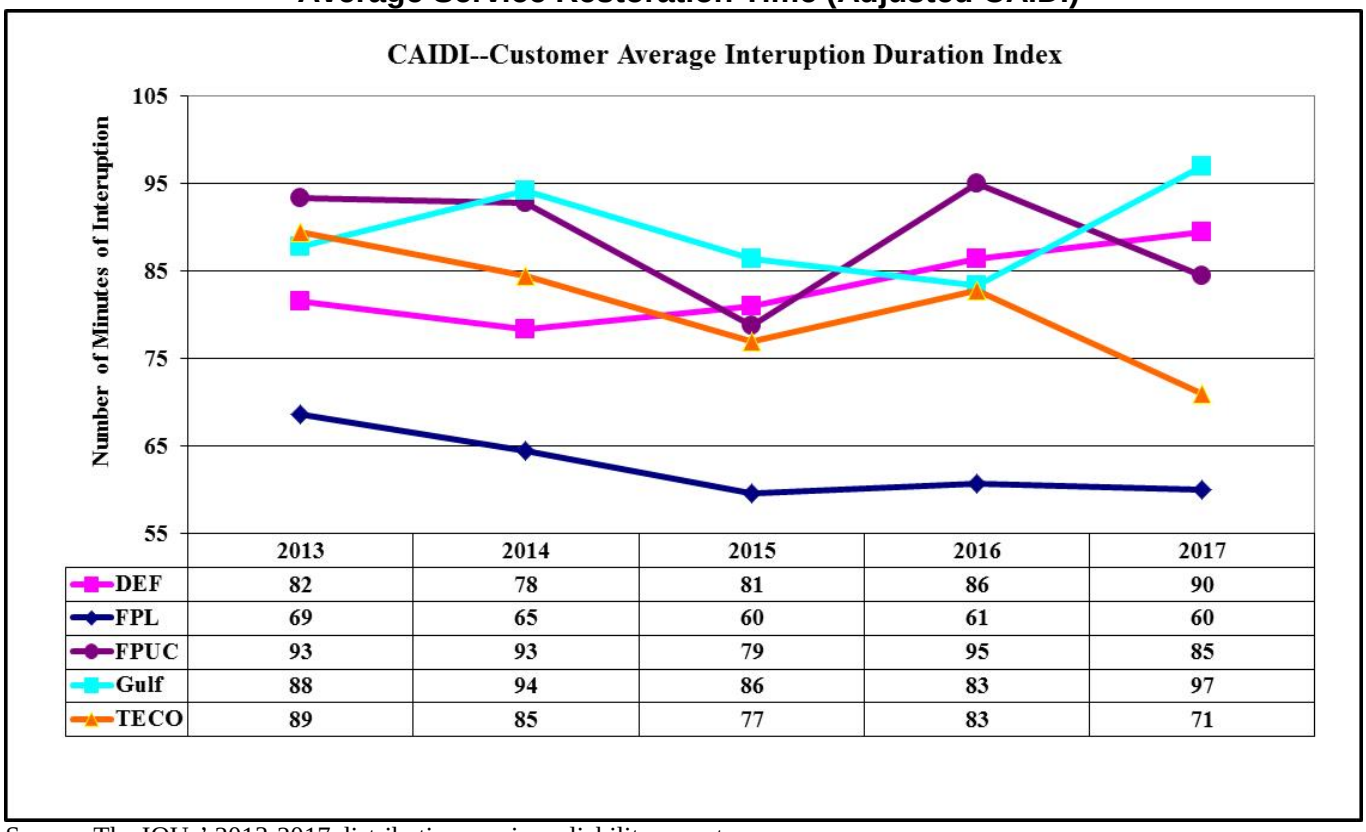
	2013	2014	2015	2016	2017
DEF	1.09	1.09	0.98	0.98	0.92
FPL	0.89	0.99	1.00	0.92	0.90
FPUC	1.82	1.89	1.62	1.95	1.64
Gulf	1.08	0.93	1.02	1.14	1.20
TECO	0.95	0.94	1.03	1.01	1.03

Source: The IOUs' 2013-2017 distribution service reliability reports.

Figure 4-3 is a five-year graph of the adjusted CAIDI for each IOU. DEF and Gulf had an increase in the CAIDI from 2016 to 2017 while FPL, FPUC, and TECO had decreases in the CAIDI. All utilities, except DEF and Gulf, CAIDI values are trending downward for the five-year period of 2013 to 2017. DEF's CAIDI value is trending upward for the same period, while Gulf's CAIDI value is trending slightly upward.

CAIDI is the average interruption duration or the time to restore service to interrupted customers. CAIDI is calculated by dividing the total system CMI by the number of customer interruptions, which is also SAIDI, divided by SAIFI.

Figure 4-3.
Average Service Restoration Time (Adjusted CAIDI)



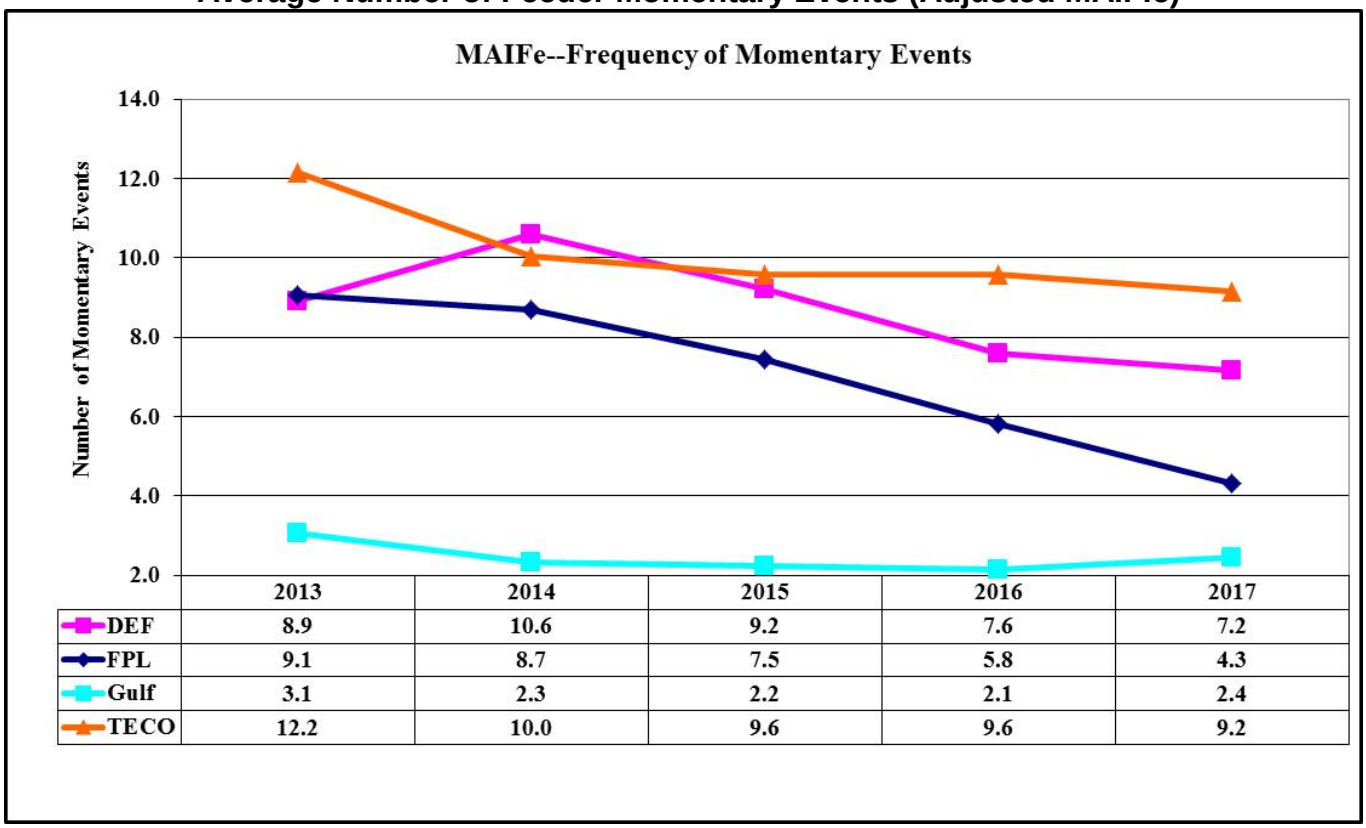
	2013	2014	2015	2016	2017
DEF	82	78	81	86	90
FPL	69	65	60	61	60
FPUC	93	93	79	95	85
Gulf	88	94	86	83	97
TECO	89	85	77	83	71

Source: The IOUs' 2013-2017 distribution service reliability reports.

Figure 4-4 shows a five-year graph of the adjusted MAIFIe for DEF, FPL, Gulf, and TECO. DEF, FPL, Gulf and TECO's MAIFIe indices are all trending downward for the five-year period of 2013 to 2017. Comparing the MAIFIe for 2016 to 2017, DEF decreased by 5 percent, FPL decreased by 26 percent, Gulf increased by 5 percent and TECO decreased by 4 percent. FPUC is exempt from reporting MAIFIe and CEMI5 because it has fewer than 50,000 customers.

MAIFIe is the average frequency of momentary interruptions events or the number of times there is a loss of service of less than one minute. MAIFIe is calculated by dividing the number of momentary interruptions events recorded on primary circuits (CME) by the number of customers served.

Figure 4-4.
Average Number of Feeder Momentary Events (Adjusted MAIFIe)

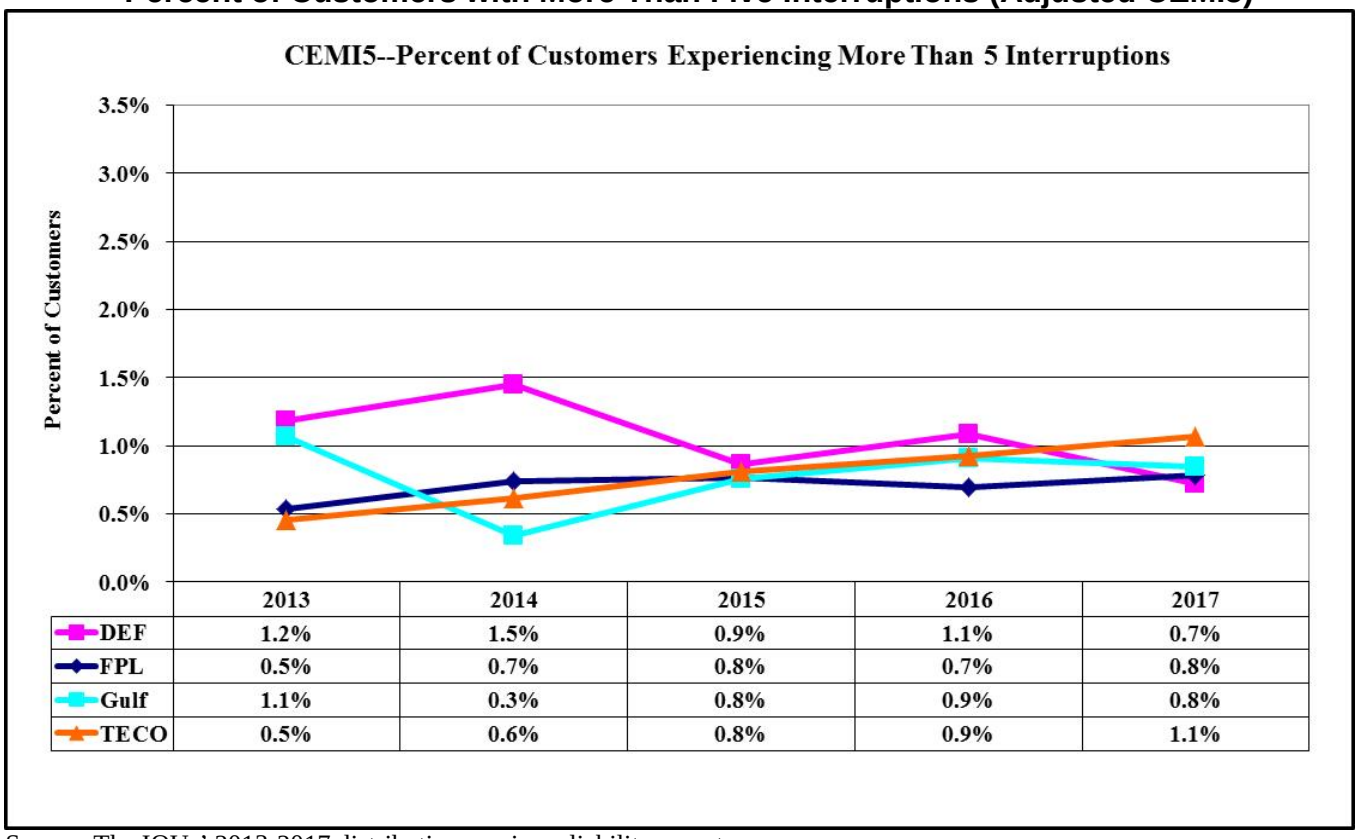


	2013	2014	2015	2016	2017
DEF	8.9	10.6	9.2	7.6	7.2
FPL	9.1	8.7	7.5	5.8	4.3
Gulf	3.1	2.3	2.2	2.1	2.4
TECO	12.2	10.0	9.6	9.6	9.2

Source: The IOUs' 2013-2017 distribution service reliability reports.

Figure 4-5 is a five-year graph of the adjusted CEMI5 for FPL, Gulf, DEF, and TECO. CEMI5 is a percentage. It represents the number of customers that experienced more than five service interruptions in the year divided by the total number of customers. In 2017, FPL and TECO's CEMI5 percent increased to 0.8 percent from 0.7 percent in 2016 for FPL and 1.1 percent from 0.9 percent in 2016 for TECO. DEF decreased from 1.1 percent in 2016 to 0.7 percent in 2017, while Gulf decreased from 0.9 percent in 2016 to 0.8 percent in 2017. FPL and TECO are trending upward as DEF is trending downward for the period of 2013 to 2017. Gulf is trending relatively flat for the same period.

Figure 4-5.
Percent of Customers with More Than Five Interruptions (Adjusted CEMI5)

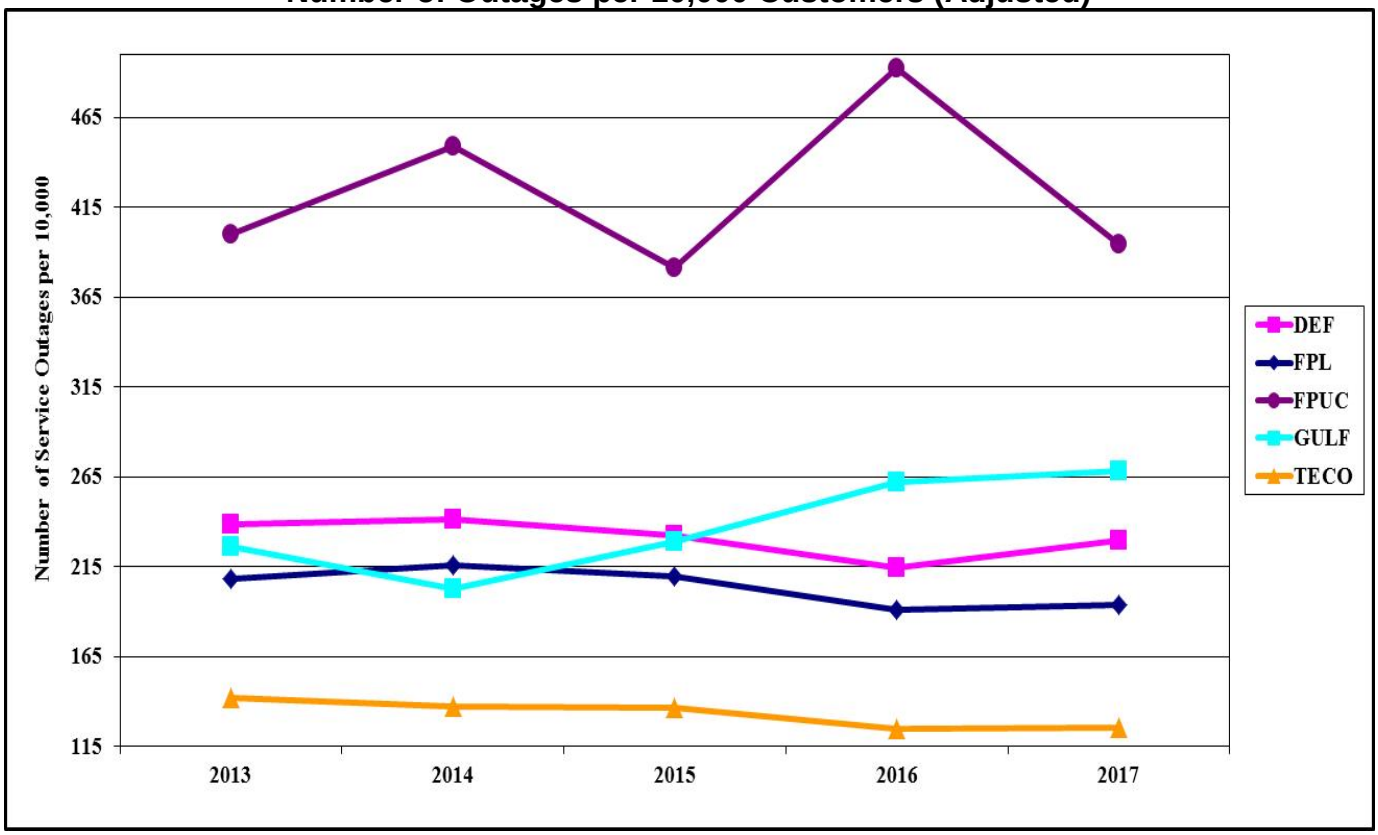


	2013	2014	2015	2016	2017
DEF	1.2%	1.5%	0.9%	1.1%	0.7%
FPL	0.5%	0.7%	0.8%	0.7%	0.8%
Gulf	1.1%	0.3%	0.8%	0.9%	0.8%
TECO	0.5%	0.6%	0.8%	0.9%	1.1%

Source: The IOUs' 2013-2017 distribution service reliability reports.

Figure 4-6 shows the number of outages per 10,000 customers on an adjusted basis for the five IOUs over the last five years. The graph displays each utility's adjusted data concerning the number of outage events and the total number of customers on an annual basis. The number of FPL outages increased from 92,686 in 2016 to 95,077 in 2017, and the number of outages per 10,000 customers is trending downward for the five-year period. TECO's results are trending downward for the five-year period. DEF's number of outages increased for 2017 and the results are trending downward for the five-year period. Gulf's number of outages increased for 2017, and is trending upward for the five-year period. FPUC's results increased for 2013 to 2014, decreased for 2014 to 2015, increased for 2015 to 2016 and decreased for 2016 to 2017. Due to the small customer base, the line graph for FPUC could be subject to greater volatility.

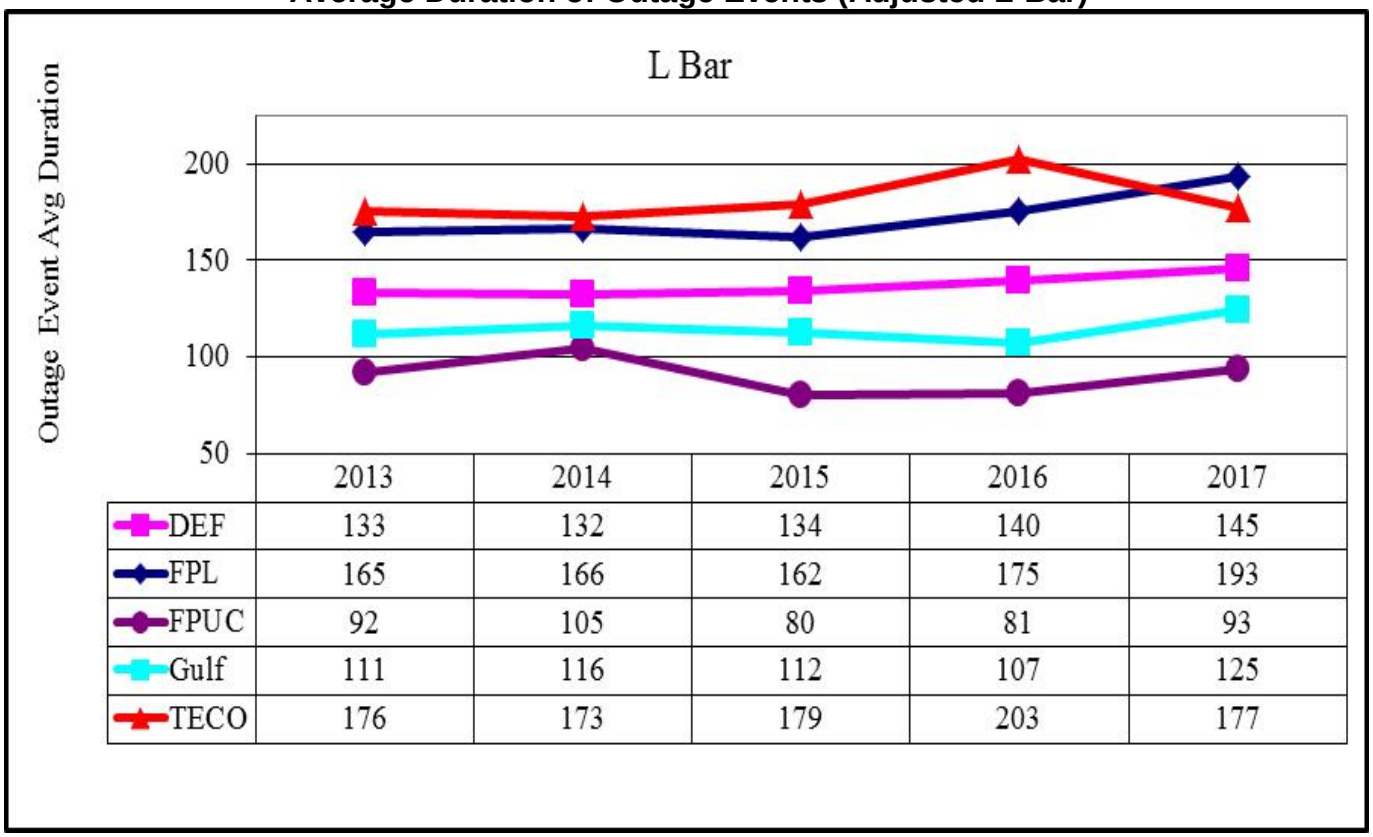
Figure 4-6.
Number of Outages per 10,000 Customers (Adjusted)



Source: The IOUs' 2013-2017 distribution service reliability reports.

Figure 4-7 represents the average duration of outage events (Adjusted L-Bar) for each IOU. From the data shown, it appears that the utilities have been consistent with their restoral times for the five-year period of 2013 to 2017, even with increases from 2016 to 2017.

Figure 4-7.
Average Duration of Outage Events (Adjusted L-Bar)



	2013	2014	2015	2016	2017
DEF	133	132	134	140	145
FPL	165	166	162	175	193
FPUC	92	105	80	81	93
Gulf	111	116	112	107	125
TECO	176	173	179	203	177

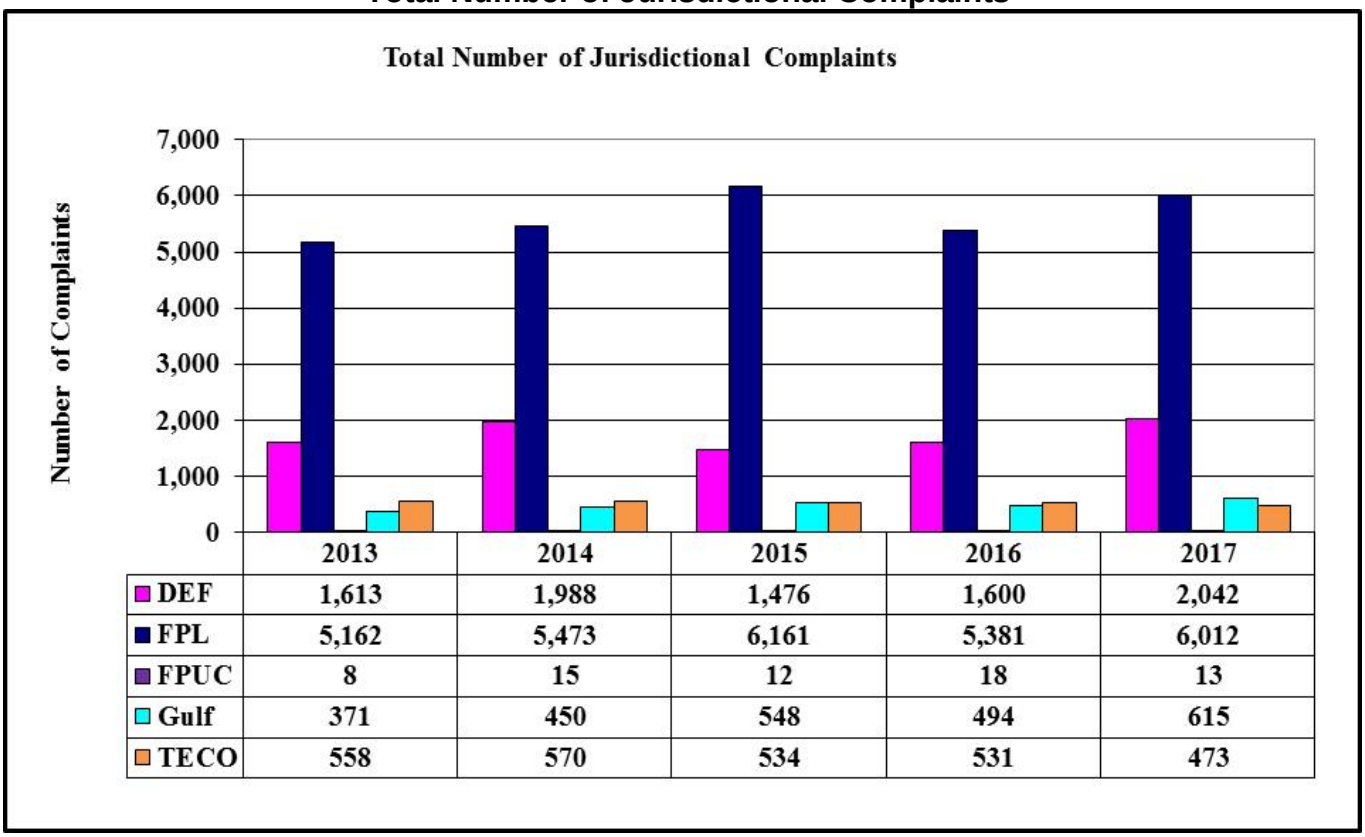
Source: The IOUs' 2013-2017 distribution service reliability reports.

Inter-Utility Comparisons of Reliability Related Complaints

Figures 4-8, **4-9**, **4-10**, and **4-11** represent consumer complaint data that was extracted from the Commission's Consumer Activity Tracking System (CATS). Each consumer complaint received by the Commission is assigned a code after the complaint is resolved. Reliability related complaints have 10 specific category types and typically pertain to Trees, Safety, Repairs, Frequent Outages, and Momentary Service Interruptions.

Figure 4-8 shows the total number of jurisdictional complaints[17] for each IOU. In comparing the number of complaints by the different companies, the total number of customers should be considered. FPL has the higher number of complaints, but FPL also has more customers than the other companies.

Figure 4-8.
Total Number of Jurisdictional Complaints



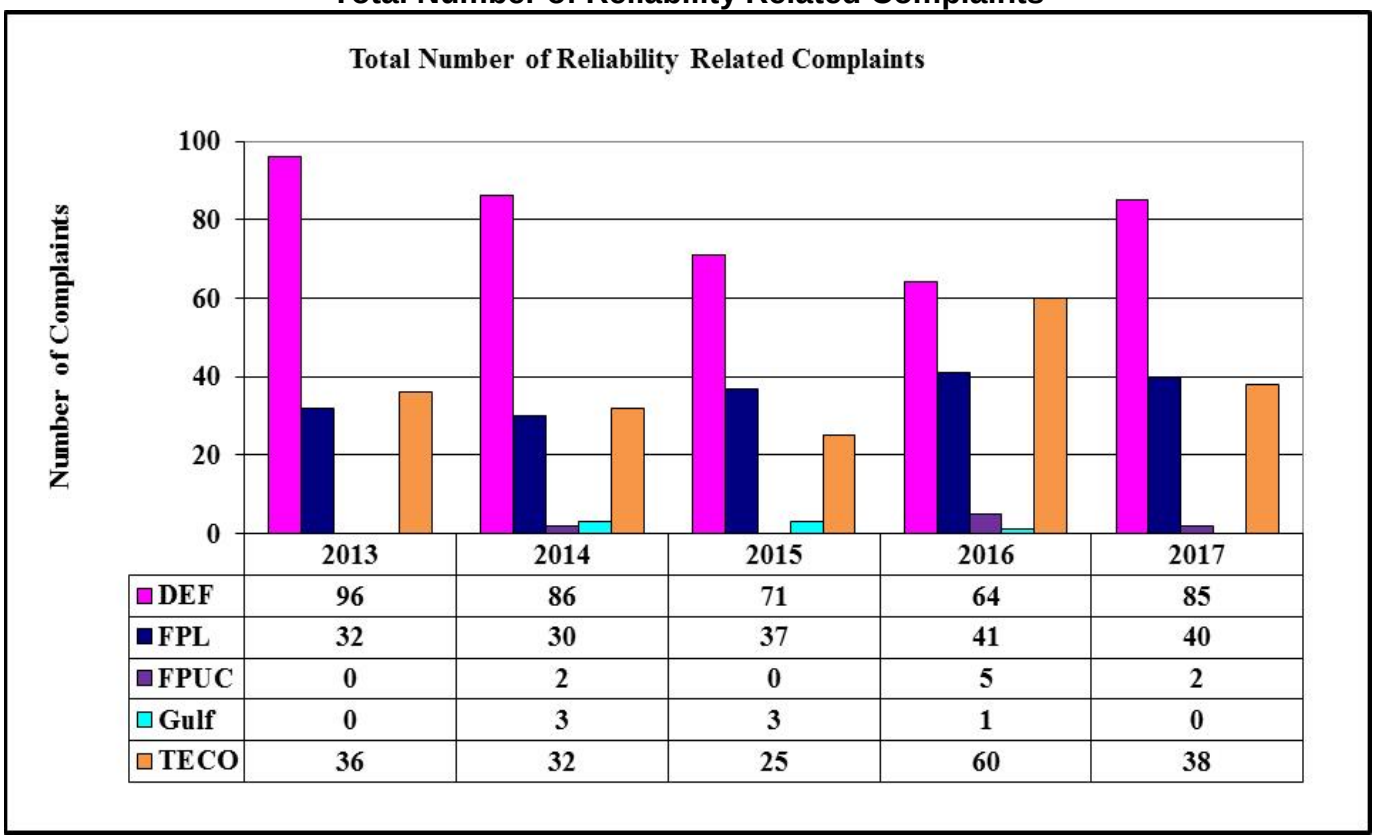
	2013	2014	2015	2016	2017
DEF	1,613	1,988	1,476	1,600	2,042
FPL	5,162	5,473	6,161	5,381	6,012
FPUC	8	15	12	18	13
Gulf	371	450	548	494	615
TECO	558	570	534	531	473

Source: FPSC CATS.

[17] Non-jurisdictional complaint codes include load management, hurricanes, and damage claims.

Figure 4-9 charts the total number of reliability related complaints for the IOUs. DEF is showing the largest amount of reliability complaints for the five-year period of 2013 to 2017 with FPUC and Gulf showing the least amount. DEF is trending downward in the number of reliability complaints, while FPL, FPUC, and TECO are trending upward. Gulf appears to be relatively flat.

Figure 4-9.
Total Number of Reliability Related Complaints

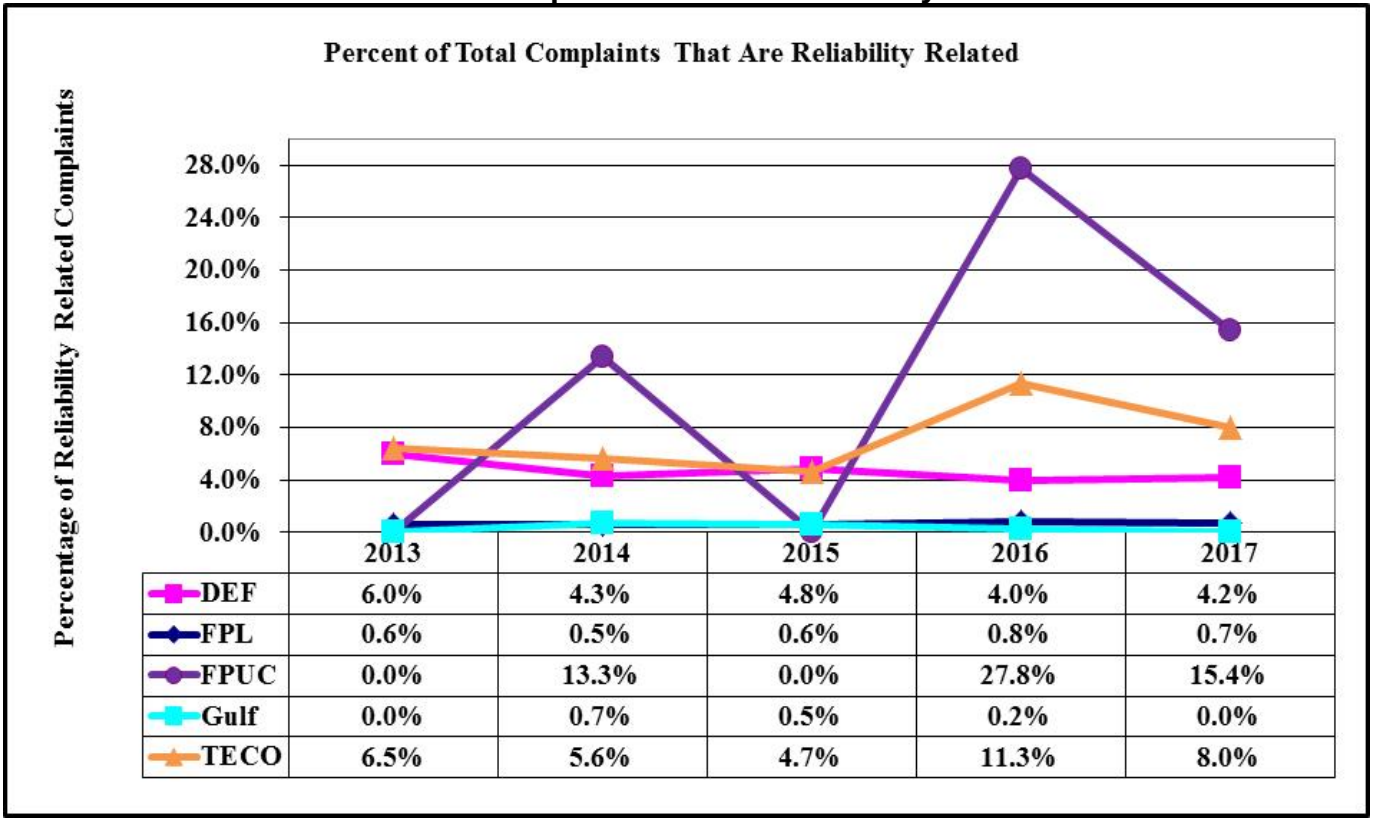


	2013	2014	2015	2016	2017
DEF	96	86	71	64	85
FPL	32	30	37	41	40
FPUC	0	2	0	5	2
Gulf	0	3	3	1	0
TECO	36	32	25	60	38

Source: FPSC CATS.

Figure 4-10 shows the percentage of reliability related customer complaints in relation to the total number of complaints for each IOU. FPL and Gulf's are relatively flat as FPUC and TECO are trending upward. DEF appears to be trending downward. The percentages of FPUC complaints compared to the other companies appears high, however FPUC has fewer customers and fewer complaints in total.

Figure 4-10.
Percent of Complaints that are Reliability Related



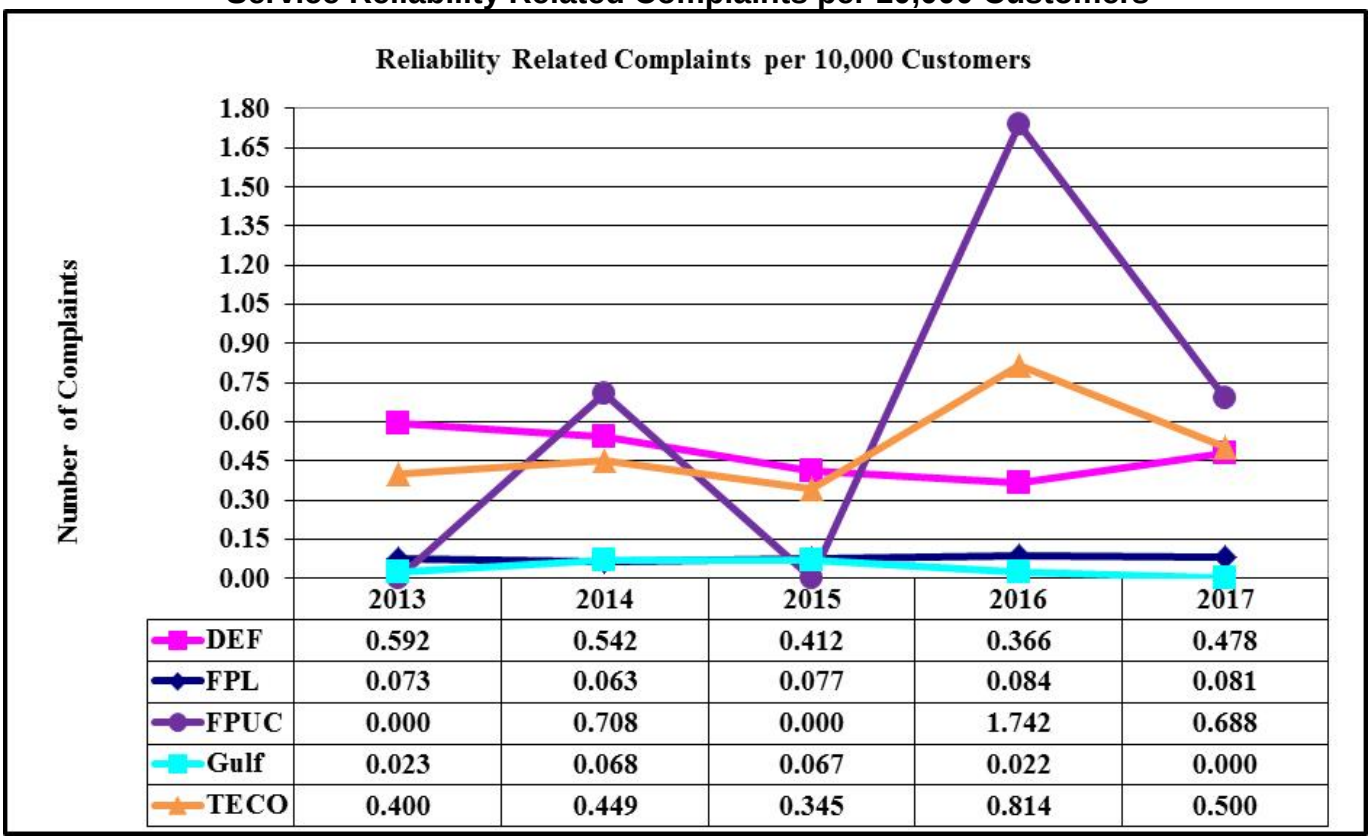
	2013	2014	2015	2016	2017
DEF	6.0%	4.3%	4.8%	4.0%	4.2%
FPL	0.6%	0.5%	0.6%	0.8%	0.7%
FPUC	0.0%	13.3%	0.0%	27.8%	15.4%
Gulf	0.0%	0.7%	0.5%	0.2%	0.0%
TECO	6.5%	5.6%	4.7%	11.3%	8.0%

Source: FPSC CATS.

Figure 4-11 charts the volume of reliability related complaints per 10,000 customers for the IOUs. The volume of service reliability complaints is normalized to a 10,000-customer base for comparative purposes. This is calculated for each IOU by dividing the total number of reliability complaints reported to the Commission by the total number of utility's customers. This fraction is then multiplied by 10,000 for graphing purposes.

All the IOUs have less than one reliability complaint per 10,000 customers since 2013 except FPUC. For the five-year period, DEF is trending downward as FPL and Gulf are staying relatively flat. FPUC and TECO are trending upward for the five-year period. The volatility of FPUC's results can be attributed to its small customer base, which typically averages 28,500 customers.

Figure 4-11.
Service Reliability Related Complaints per 10,000 Customers



	2013	2014	2015	2016	2017
DEF	0.592	0.542	0.412	0.366	0.478
FPL	0.073	0.063	0.077	0.084	0.081
FPUC	0.000	0.708	0.000	1.742	0.688
Gulf	0.023	0.068	0.067	0.022	0.000
TECO	0.400	0.449	0.345	0.814	0.500

Source: The IOUs' 2013-2017 distribution service reliability reports and FPSC CATS.

Section V: Appendices

Appendix A – Adjusted Service Reliability Data

Duke Energy Florida, LLC

Table A-1.
DEF's Number of Customers (Year End)

	2013	2014	2015	2016	2017
North Central	383,011	388,187	396,395	400,510	406,483
North Coastal	194,394	196,321	198,525	200,565	203,300
South Central	438,088	449,363	458,457	470,534	484,848
South Coastal	656,073	663,973	670,743	677,255	682,618
DEF System	**1,671,566**	**1,697,844**	**1,724,120**	**1,748,864**	**1,777,249**

Source: DEF's 2013-2017 distribution service reliability reports.

Table A-2.
DEF's Adjusted Regional Indices SAIDI, SAIFI, and CAIDI

	Average Interruption Duration Index (SAIDI)					Average Interruption Frequency Index (SAIFI)					Average Customer Restoration Time Index (CAIDI)				
	2013	2014	2015	2016	2017	2013	2014	2015	2016	2017	2013	2014	2015	2016	2017
North Central	91	84	72	78	75	1.11	1.11	0.85	0.90	0.84	82	76	84	87	90
North Coastal	147	159	145	155	154	1.51	1.57	1.47	1.39	1.45	97	101	99	111	107
South Central	88	83	72	79	70	0.97	1.04	0.91	1.01	0.84	91	80	77	78	83
South Coastal	71	66	71	73	75	1.04	0.96	0.97	0.90	0.88	69	68	74	81	85
DEF System	**89**	**85**	**80**	**85**	**83**	**1.09**	**1.09**	**0.98**	**0.98**	**0.92**	**82**	**78**	**81**	**86**	**90**

Source: DEF's 2013-2017 distribution service reliability reports.

Table A-3.
DEF's Adjusted Regional Indices MAIFIe and CEMI5%

	Average Frequency of Momentary Events on Feeders (MAIFIe)					Percentage of Customers Experiencing More than 5 Service Interruptions (CEMI5%)				
	2013	2014	2015	2016	2017	2013	2014	2015	2016	2017
North Central	8.9	10.8	8.3	8.6	7.6	1.53%	1.07%	0.32%	0.36%	0.37%
North Coastal	8.1	10.0	7.1	7.8	8.2	4.13%	3.47%	3.96%	4.00%	2.83%
South Central	7.8	10.3	8.1	7.0	6.9	0.80%	1.04%	0.64%	1.06%	0.87%
South Coastal	9.9	10.8	11.2	7.3	6.8	0.38%	1.36%	0.43%	0.68%	0.21%
DEF System	**8.9**	**10.6**	**9.2**	**7.6**	**7.2**	**1.19%**	**1.45%**	**0.87%**	**1.09%**	**0.73%**

Source: DEF's 2013-2017 distribution service reliability reports.

Table A-4.
DEF's Primary Causes of Outages Events

	Adjusted Number of Outages Events						Adjusted L-Bar Length of Outages				
	2013	2014	2015	2016	2017	Percentages	2013	2014	2015	2016	2017
Animals	5,488	5,020	5,321	5,369	5,597	13.7%	71	75	75	80	80
Storm	4,755	-	-	-	-	-	115	-	-	-	-
Tree-Preventable	3,938	-	-	-	-	-	123	-	-	-	-
Unknown	3,333	2,867	1,224	1,097	998	2.4%	84	82	77	90	94
All Other	7,015	8,073	7,900	7,390	8,287	20.3%	147	170	167	174	180
Defective Equipment	3,358	7,221	8,572	9,195	10,475	25.7%	171	150	142	147	150
Vehicle-Const. Equipment	392	-	-	-	-	-	222	-	-	-	-
Connector Failure	3,000	-	-	-	-	-	117	-	-	-	-
Tree Non-preventable	5,205	-	-	-	-	-	154	-	-	-	-
UG Primary	2,039	-	-	-	-	-	252	-	-	-	-
Lightning	1,344	1,647	1,201	1,216	1,261	3.1%	178	166	145	150	151
Vegetation	-	9,816	8,240	7,879	8,143	20.0%	-	137	136	145	150
Other Weather	-	5,875	7,141	4,965	5,478	13.4%	-	108	134	134	145
Vehicle	-	420	412	429	505	1.2%	-	241	227	235	223
DEF System	**39,867**	**40,939**	**40,011**	**37,540**	**40,744**	**100%**	**133**	**132**	**134**	**140**	**145**

Note: (1) All Other category is the sum of diverse causes of outage events which individually are not among the top 10 causes of outage events.

(2) Commission staff requested that, beginning with 2014 data, all IOU's use the same outage categories for comparison purposes. As such, the Vegetation, Defective Equipment, and Other Weather now include outage categories that in the past were separately identified.

Source: DEF's 2013-2017 distribution service reliability reports.

Florida Power & Light Company

Table A-5.
FPL's Number of Customers (Year End)

	2013	2014	2015	2016	2017
Boca Raton	361,932	366,503	370,266	374,080	378,125
Brevard	293,491	297,877	301,843	305,151	307,825
Central Dade	277,807	282,155	287,147	292,421	297,237
Central Florida	275,033	279,726	283,868	286,492	289,426
Gulf Stream	327,898	331,643	335,006	337,828	339,518
Manasota	372,514	378,304	384,138	390,400	395,636
North Dade	232,018	235,112	237,328	240,194	241,259
North Florida	146,184	150,052	153,683	157,967	161,216
Naples	371,866	379,012	386,710	394,355	399,295
Pompano	306,692	310,483	314,209	317,731	319,630
South Dade	295,283	299,919	304,336	309,022	311,692
Toledo Blade	249,533	254,982	260,053	265,547	269,787
Treasure Coast	279,202	283,693	287,508	291,334	294,545
West Dade	249,935	254,130	257,539	261,484	264,888
West Palm	351,875	357,064	361,717	364,292	366,570
Wingate	265,120	268,737	271,478	273,692	276,218
FPL System	**4,656,383**	**4,729,392**	**4,796,829**	**4,861,990**	**4,912,867**

Source: FPL's 2013-2017 distribution service reliability reports.

Table A-6.
FPL's Adjusted Regional Indices SAIDI, SAIFI, and CAIDI

	Average Interruption Duration Index (SAIDI)					Average Interruption Frequency Index (SAIFI)					Average Customer Restoration Time Index (CAIDI)				
	2013	2014	2015	2016	2017	2013	2014	2015	2016	2017	2013	2014	2015	2016	2017
Boca Raton	61	63	54	51	45	1.10	1.21	1.08	1.08	0.89	55	52	50	47	50
Brevard	56	69	53	53	56	0.89	1.14	0.96	0.87	1.04	63	61	55	60	54
Central Dade	51	54	47	41	42	0.67	0.80	0.78	0.66	0.79	75	68	60	63	53
Central Florida	67	61	50	49	46	0.93	0.95	0.90	0.80	0.85	71	64	55	61	54
Gulf Stream	59	58	52	43	42	0.93	0.96	0.88	0.83	0.79	63	60	59	51	54
Manasota	58	57	55	52	50	0.83	0.83	1.00	0.91	0.77	70	68	55	57	65
North Dade	60	77	71	59	69	0.68	0.83	0.87	0.72	0.96	88	92	82	82	72
North Florida	84	77	68	64	64	1.10	1.06	1.08	1.00	1.04	76	73	63	64	62
Naples	55	58	57	56	64	0.68	0.88	0.91	0.97	0.92	79	66	62	57	69
Pompano	49	52	57	48	38	0.69	0.86	1.03	0.80	0.65	71	61	55	60	58
South Dade	77	73	76	68	63	0.99	0.90	1.08	0.99	0.79	77	81	71	69	80
Toledo Blade	72	73	65	75	77	1.04	1.16	0.98	1.14	1.12	70	63	66	66	69
Treasure Coast	72	74	72	81	66	1.08	1.07	1.05	1.19	1.11	67	69	69	68	59
West Dade	59	72	68	56	54	0.85	1.20	1.24	0.99	0.85	69	60	55	57	63
West Palm	54	49	55	51	46	0.95	0.85	1.01	0.88	0.96	57	58	55	58	47
Wingate	70	74	64	58	61	0.99	1.25	1.14	0.86	1.11	71	59	57	67	55
FPL System	**61**	**64**	**59**	**56**	**54**	**0.89**	**0.99**	**1.00**	**0.92**	**0.90**	**69**	**65**	**60**	**61**	**60**

Source: FPL's 2013-2017 distribution service reliability reports.

Table A-7.
FPL's Adjusted Regional Indices MAIFIe and CEMI5%

	Average Frequency of Momentary Events on Feeders (MAIFIe)					Percentage of Customers Experiencing More than 5 Service Interruptions (CEMI5%)				
	2013	2014	2015	2016	2017	2013	2014	2015	2016	2017
Boca Raton	8.4	8.6	7.4	5.6	4.6	1.31%	0.89%	0.76%	1.36%	0.37%
Brevard	10.1	9.6	7.8	5.2	4.0	0.58%	0.33%	0.27%	0.17%	0.86%
Central Dade	6.7	7.8	7.5	5.0	3.6	0.08%	0.66%	0.29%	0.55%	0.78%
Central Florida	10.0	8.9	6.5	5.2	3.4	0.52%	0.51%	0.30%	0.15%	0.24%
Gulf Stream	8.7	8.8	6.6	5.1	4.0	0.45%	0.68%	0.79%	0.13%	0.60%
Manasota	7.7	7.0	6.1	5.3	4.0	0.23%	0.33%	0.91%	0.21%	0.34%
North Dade	6.8	8.4	7.7	5.3	3.3	0.45%	0.89%	1.01%	0.28%	1.23%
North Florida	10.8	10.3	8.7	5.8	4.2	0.47%	0.60%	0.71%	0.44%	0.72%
Naples	7.0	7.0	7.1	6.8	6.0	0.36%	0.74%	0.56%	0.44%	0.34%
Pompano	7.5	6.9	6.1	4.5	3.1	0.07%	0.46%	1.01%	1.23%	0.07%
South Dade	8.0	7.9	7.1	5.8	4.3	0.70%	0.61%	0.89%	0.24%	0.67%
Toledo Blade	12.9	9.7	8.2	7.8	4.5	1.21%	1.33%	0.65%	1.57%	1.48%
Treasure Coast	14.3	11.0	8.1	6.4	4.0	0.87%	0.96%	1.03%	2.87%	1.73%
West Dade	7.3	8.2	7.8	6.4	4.4	0.29%	0.60%	1.46%	0.57%	0.72%
West Palm	9.8	8.5	7.5	5.5	4.4	0.73%	1.39%	1.01%	0.50%	2.04%
Wingate	11.6	12.9	10.4	7.9	6.5	0.22%	0.81%	0.59%	0.53%	0.66%
FPL System	**9.1**	**8.7**	**7.5**	**5.8**	**4.3**	**0.54%**	**0.74%**	**0.76%**	**0.70%**	**0.78%**

Source: FPL's 2013-2017 distribution service reliability reports.

Table A-8.
FPL's Primary Causes of Outage Events

	Adjusted Number of Outage Events						Adjusted L-Bar Length of Outages				
	2013	2014	2015	2016	2017	Percentages	2013	2014	2015	2016	2017
Equipment Failure	31,110	-	-	-	-	-	199	-	-	-	-
Unknown	12,000	11,703	11,022	10,139	10,436	11.0%	122	124	124	133	163
Vegetation	18,774	21,633	23,155	20,331	17,264	18.2%	183	187	182	197	205
Animals	10,320	9,359	9,878	9,506	9,219	9.7%	94	94	93	100	109
Remaining Causes	5,075	3,410	3,147	2,821	3,308	3.5%	201	142	140	158	167
Other Weather	5,795	10,141	9,426	7,978	7,458	7.8%	125	160	167	173	215
Other	7,826	9,187	8,358	7,340	9,402	9.9%	143	148	149	161	217
Lightning	1,567	1,938	1,770	1,647	1,192	1.3%	246	245	241	255	245
Equipment Connect	3,306	-	-	-	-	-	148	-	-	-	-
Vehicle	1,042	877	969	911	1,026	1.1%	230	251	230	248	253
Request	27	-	-	-	-	-	80	-	-	-	-
Defective Equipment	-	33,733	32,838	32,013	35,772	37.6%	-	190	179	195	206
FPL System	**96,842**	**101,981**	**100,563**	**92,686**	**95,077**	**100%**	**165**	**166**	**162**	**175**	**193**

Notes: (1) Other category is a sum of outages events that require a detailed explanation.
(2) Remaining Causes category is the sum of many diverse causes of outage events, which individually are not among the top 10 causes of outage events, and excludes those identified as Other.
(3) Starting in 2014, Defective Equipment includes Equipment Failure, Equipment Connect and Dig-in, which were all separate categories, in prior years.
Source: FPL's 2013-2017 distribution service reliability reports.

Florida Public Utilities Company

Table A-9.
FPUC's Number of Customers (Year End)

	2013	2014	2015	2016	2017
Fernandina(NE)	15,509	15,628	15,787	16,037	16,286
Marianna (NW)	12,602	12,621	12,649	12,663	12,764
FPUC System	**28,111**	**28,249**	**28,436**	**28,700**	**29,050**

Source: FPUC's 2013-2017 distribution service reliability reports.

Table A-10
FPUC's Adjusted Regional Indices SAIDI, SAIFI, and CAIDI

	Average Interruption Duration Index (SAIDI)					Average Interruption Frequency Index (SAIFI)					Average Customer Restoration Time Index (CAIDI)				
	2013	2014	2015	2016	2017	2013	2014	2015	2016	2017	2013	2014	2015	2016	2017
NE	76	88	105	128	93	0.95	1.14	1.19	1.41	1.04	81	77	88	90	89
NW	284	284	155	258	197	2.89	2.81	2.15	2.63	2.41	98	101	72	98	82
FPUC System	**170**	**175**	**127**	**185**	**139**	**1.82**	**1.89**	**1.62**	**1.95**	**1.64**	**93**	**93**	**79**	**95**	**85**

Source: FPUC's 2013-2017 distribution service reliability reports.

Table A-11.
FPUC's Primary Causes of Outage Events

	Adjusted Number of Outage Events						Adjusted L-Bar Length of Outages				
	2013	2014	2015	2016	2017	Percentages	2013	2014	2015	2016	2017
Vegetation	265	262	295	436	354	30.9%	83	87	76	78	83
Animals	275	245	201	354	267	23.3%	56	60	53	51	56
Lightning	48	96	148	128	77	6.7%	85	110	90	82	81
Unknown	95	66	75	89	62	5.4%	64	67	64	75	89
Corrosion	65	-	-	12	-	-	92	-	-	102	-
All Other	32	45	27	58	44	3.8%	96	62	94	65	86
Other Weather	299	381	178	148	152	13.3%	136	155	94	147	168
Trans. Failure	29	-	-	-	-	-	148	-	-	-	-
Vehicle	16	25	25	26	30	2.6%	117	108	130	121	94
Defective Equipment	-	138	136	163	160	14.0%	-	232	97	94	117
FPUC System	**1,124**	**1,258**	**1,085**	**1,414**	**1,146**	**100%**	**92**	**105**	**80**	**81**	**93**

Notes: (1) All Other category is the sum of many diverse causes of outage events which individually are not one of the top 10 causes of outage events.
(2) Blanks are shown for years where the quantity of outages was less than one of the top 10 causes of outage event.
(3) Beginning with 2014, the Defective Equipment category now includes outage categories that in the past were separately identified.
Source: FPUC's 2013-2017 distribution service reliability reports.

Gulf Power Company

Table A-12.
Gulf's Number of Customers (Year End)

	2013	2014	2015	2016	2017
Central	113,179	114,363	115,524	116,745	118,010
Eastern	112,462	113,897	115,099	116,702	117,847
Western	213,748	215,787	218,848	221,968	225,949
Gulf System	**439,389**	**444,047**	**449,471**	**455,415**	**461,806**

Source: Gulf's 2013-2017 distribution service reliability reports.

Table A-13.
Gulf's Adjusted Regional Indices SAIDI, SAIFI, and CAIDI

	Average Interruption Duration Index (SAIDI)					Average Interruption Frequency Index (SAIFI)					Average Customer Restoration Time Index (CAIDI)				
	2013	2014	2015	2016	2017	2013	2014	2015	2016	2017	2013	2014	2015	2016	2017
Central	62	115	75	91	110	0.79	1.07	0.82	1.04	1.05	79	107	92	88	105
Eastern	118	73	59	93	108	1.25	0.78	0.86	1.21	1.27	95	93	69	77	85
Western	100	81	110	97	123	1.14	0.94	1.21	1.15	1.24	87	87	91	85	100
Gulf System	**95**	**88**	**88**	**95**	**116**	**1.08**	**0.93**	**1.02**	**1.14**	**1.20**	**88**	**94**	**86**	**83**	**97**

Source: Gulf's 2013-2017 distribution service reliability reports.

Table A-14.
Gulf's Adjusted Regional Indices MAIFIe and CEMI5%

	Average Frequency of Momentary Events on Feeders (MAIFIe)					Percentage of Customers Experiencing More than 5 Service Interruptions (CEMI5%)				
	2013	**2014**	**2015**	**2016**	**2017**	**2013**	**2014**	**2015**	**2016**	**2017**
Central	3.0	2.8	1.8	1.5	2.1	0.17%	0.36%	0.17%	0.22%	0.91%
Eastern	2.3	1.9	1.7	1.6	2.3	2.78%	0.43%	1.66%	1.84%	0.86%
Western	3.5	2.3	2.7	2.7	2.7	0.64%	0.28%	0.59%	0.77%	0.80%
Gulf System	**3.1**	**2.3**	**2.2**	**2.1**	**2.4**	**1.07%**	**0.34%**	**0.76%**	**0.91%**	**0.84%**

Source: Gulf's 2013-2017 distribution service reliability reports.

Table A-15.
Gulf's Primary Causes of Outage Events

	Adjusted Number of Outage Events						Adjusted L-Bar Length of Outages				
	2013	2014	2015	2016	2017	Percentages	2013	2014	2015	2016	2017
Animals	2,857	2,132	2,743	3,557	3,514	28.3%	64	64	60	65	70
Lightning	1,452	1,827	1,788	1,913	1,633	13.2%	139	136	134	138	164
Deterioration	2,067	-	-	-	-	-	146	-	-	-	-
Unknown	715	557	598	748	818	6.6%	85	86	79	82	101
Trees	1,354	-	-	-	-	-	129	-	-	-	-
Vehicle	272	289	293	381	377	3.0%	178	185	170	164	171
All Other	314	445	379	457	428	3.5%	112	113	101	100	113
Wind/Rain	203	-	-	-	-	-	151	-	-	-	-
Vines	237	-	-	-	-	-	91	-	-	-	-
Other	249	-	-	-	-	-	102	-	-	-	-
Contamination Corrosion	211	-	-	-	-	-	118	-	-	-	-
Vegetation	-	1,294	1,888	1,954	2,460	19.8%	-	123	138	116	144
Other Weather	-	196	251	220	366	3.0%	-	181	137	126	243
Defective Equipment	-	2,257	2,340	2,714	2,804	22.6%	-	138	137	132	140
Gulf System	**9,931**	**8,997**	**10,280**	**11,944**	**12,400**	**100%**	**111**	**116**	**112**	**107**	**125**

Notes: (1) All Other category is the sum of many diverse causes of outage events which individually are not among the top 10 causes of outages events.
(2) Blanks are shown for years where the number of outages was too small to be among the top 10 causes of outage events.
(3) The Defective Equipment, Other Weather, and Vegetation categories now include outage categories that in the past were separately identified.
Source: Gulf's 2013-2017 distribution service reliability reports.

Tampa Electric Company

Table A-16.
TECO's Number of Customers (Year End)

	2013	2014	2015	2016	2017
Central	188,161	190,459	193,436	196,431	202,572
Dade City	13,965	14,165	14,372	14,492	14,801
Eastern	113,053	115,122	117,268	119,286	122,667
Plant City	56,438	57,220	58,472	59,381	61,187
South Hillsborough	67,071	69,431	72,340	75,450	80,194
Western	193,320	196,085	198,224	199,891	203,805
Winter Haven	68,529	69,687	70,799	71,888	74,403
TECO System	**700,537**	**712,169**	**724,911**	**736,819**	**759,629**

Source: TECO's 2013-2017 distribution service reliability reports.

Table A-17.
TECO's Adjusted Regional Indices SAIDI, SAIFI, and CAIDI

	Average Interruption Duration Index (SAIDI)					Average Interruption Frequency Index (SAIFI)					Average Customer Restoration Time Index (CAIDI)				
	2013	2014	2015	2016	2017	2013	2014	2015	2016	2017	2013	2014	2015	2016	2017
Central	70	63	70	63	64	0.79	0.80	1.06	0.85	0.82	88	79	66	74	78
Dade City	261	206	199	153	153	2.75	2.36	1.92	1.79	2.10	95	87	104	86	73
Eastern	93	76	67	85	63	0.87	0.96	0.90	0.99	0.89	106	80	75	86	72
Plant City	131	117	117	113	92	1.49	1.47	1.46	1.20	1.44	87	79	80	94	64
South Hillsborough	94	74	86	104	84	1.11	0.85	1.10	1.35	1.20	84	88	78	77	70
Western	75	81	78	81	71	0.86	0.86	0.89	0.94	0.99	88	94	87	86	72
Winter Haven	61	77	66	82	76	0.81	0.93	0.93	0.94	1.21	76	83	71	87	62
TECO System	**85**	**80**	**79**	**83**	**73**	**0.95**	**0.94**	**1.03**	**1.00**	**1.03**	**89**	**85**	**77**	**83**	**71**

Source: TECO's 2013-2017 distribution service reliability reports.

Table A-18.
TECO's Adjusted Regional Indices MAIFIe and CEMI5%

	Average Frequency of Momentary Events on Feeders (MAIFIe)					Percentage of Customers Experiencing More than 5 Service Interruptions (CEMI5%)				
	2013	2014	2015	2016	2017	2013	2014	2015	2016	2017
Central	10.0	8.3	8.5	7.8	7.9	0.20%	0.83%	0.51%	0.96%	0.18%
Dade City	17.4	19.8	18.0	14.7	14.2	1.48%	5.94%	10.41%	2.72%	6.64%
Eastern	13.8	9.9	9.1	9.2	8.8	0.41%	0.33%	0.27%	0.47%	1.79%
Plant City	17.8	15.1	11.8	13.4	12.8	1.65%	1.37%	2.61%	2.15%	3.02%
South Hillsborough	12.9	8.7	11.0	12.8	10.8	0.84%	0.23%	0.82%	0.17%	2.43%
Western	10.9	9.6	8.7	8.8	8.4	0.33%	0.15%	0.42%	0.63%	0.30%
Winter Haven	12.6	11.4	11.1	9.7	9.7	0.01%	0.54%	0.15%	1.81%	0.20%
TECO System	**12.2**	**10.0**	**9.6**	**9.6**	**9.2**	**0.45%**	**0.62%**	**0.81%**	**0.92%**	**1.07%**

Source: TECO's 2013-2017 distribution service reliability reports.

Table A-19.
TECO's Primary Causes of Outage Events

	Adjusted Number of Outage Events						Adjusted L-Bar Length of Outages				
	2013	2014	2015	2016	2017	Percentages	2013	2014	2015	2016	2017
Lightning	1,639	1,917	1,779	1,751	1,258	13.2%	214	199	218	255	206
Animals	1,918	1,483	1,321	1,178	1,632	17.2%	95	98	100	97	105
Vegetation	1,959	1,974	2,064	1,959	2,108	22.2%	202	192	190	214	195
Unknown	892	850	792	931	972	10.2%	143	134	125	144	141
Other Weather	261	209	166	-	-	-	190	82	192	-	-
Electrical	1,154	-	-	-	-	-	186	-	-	-	-
Bad Connection	837	-	-	-	-	-	229	-	-	-	-
Vehicle	306	343	397	363	401	4.2%	215	76	199	211	214
Defective Equipment	206	2,788	2,803	2,581	2,494	26.2%	164	419	198	243	203
All Other	187	182	559	428	649	6.8%	141	165	166	173	147
Down Wire	599	-	-	-	-	-	187	-	-	-	-
TECO System	**9,958**	**9,746**	**9,881**	**9,191**	**9,514**	**100%**	**176**	**173**	**179**	**203**	**177**

Notes: (1) All Other category is the sum of many diverse causes of outage events which individually are not among the top 10 causes of outages events.
(2) Blanks are shown for years where the number of outages was too small to be among the top 10 causes of outage events.
(3) Beginning in 2014, the Defective Equipment category now includes outage categories that in the past were separately identified.
Source: TECO's 2013-2017 distribution service reliability reports.

Appendix B. Summary of Municipal Electric Utility Reports Pursuant to Rule 25-6.0343, F.A.C. – Calendar Year 2017

Utility	The extent to which Standards of construction address:					Transmission & Distribution Facility Inspections				Vegetation Management Plan (VMP)	
	Guided by Extreme Wind Loading per Figure 250-2(d)		Effects of flooding & storm surges on UG and OH distribution facilities	Placement of distribution facilities to facilitate safe and efficient access	Written safety, pole reliability, pole loading capacity and engineering standards for attachments	Description of policies, guidelines, practices, procedures, cycles, and pole selection	Number and percent of poles and structures planned and completed	Number and percent of poles and structures failing inspections with reasons	Number and percent of poles and structures by class replaced or remediated with description	Description of policies, guidelines, practices, procedures, tree removals, with sufficient explanation	Quantity, level, and scope of planned and completed for transmission and distribution
	Major Planned Work Expansion, Rebuild or Relocation	Targeted Critical Infrastructures and major thoroughfares									
Alachua, City of	Yes	Yes. The City design is based on 110 mph wind load with a 1.25 (minimum) safety factor for wind gusts.	Non-coastal utility; therefore storm surge is not an issue.	Yes	Yes	The City's inspection cycle is on an eight-year cycle (12.5% per year) The City of Alachua owns only distribution poles, no transmission poles. In October 2015, the City completed its first eight-year cycle.	For 2017, the City inspected 374 (16.4%) of its 2,271 distribution poles.	From the 2017 inspection report: 32 (9%) poles were rejected. Six poles were deemed priority rejects requiring immediate change-out due to shell rot. 26 poles were deemed non-priority rejects due to shell rot, decay top, split top and woodpecker holes.	From the 2017 inspection report: the failed poles were 40, 45, or 50 foot, Class 3 or 4 and replaced accordingly. The 26 non-priority reject poles were treated and wrapped.	The City continues to use the information from the PURC conference held in 2007 and 2009, to improve vegetation management.	The City trims approximately 62 miles of overhead distribution on a three-year cycle. Approximately 20% of the facilities are trimmed each year. GIS mapping system is used to track trimming annually and to budget annual trimming projects.

Appendix B. Summary of Municipal Electric Utility Reports Pursuant to Rule 25-6.0343, F.A.C. – Calendar Year 2017

	The extent to which Standards of construction address:					Transmission & Distribution Facility Inspections				Vegetation Management Plan (VMP)	
	Guided by Extreme Wind Loading per Figure 250-2(d)										
Utility	Major Planned Work Expansion, Rebuild or Relocation	Targeted Critical Infrastructures and major thoroughfares	Effects of flooding & storm surges on UG and OH distribution facilities	Placement of distribution facilities to facilitate safe and efficient access	Written safety, pole reliability, pole loading capacity and engineering standards for attachments	Description of policies, guidelines, practices, procedures, cycles, and pole selection	Number and percent of poles and structures planned and completed	Number and percent of poles and structures failing inspections with reasons	Number and percent of poles and structures by class replaced or remediated with description	Description of policies, guidelines, practices, procedures, tree removals, with sufficient explanation	Quantity, level, and scope of planned and completed for transmission and distribution
Bartow, City of	Yes. The City is currently guided by the EWL standards as specified in the 2017 edition of the NESC. The City lies within the 100-110 mph region.	Yes	Non-coastal utility; therefore storm surge is not an issue.	Yes	Yes	The facilities are inspected on an eight-year cycle. Inspections are visual, and tests are made to identify shell rot, insect infestation, and excavated to determine strength.	The City began round two of its eight-year pole inspection cycle in 2016 and elected to perform pole inspections every other year. In 2017, the City did not complete any pole inspections.	260 (19%) distribution poles failed inspection due to pole top rot or rotten ground decay in 2016.	16 poles were replaced ranging in size from 30 to 45 feet Classes 4 to 5 in 2017. Also in 2017, 78 poles were braced ranging in size from 30 to 45 feet Classes 4 to 5.	The City is on a four-year trim cycle with trim out at 6-10 feet clearance depending on the situation and type of vegetation, along with foliage and herbicidal treatments.	The City feels that its four-year cycle and other vegetation management practices are effective in offering great reliability to its customers. The City is currently contracting additional line clearance personnel to keep on the four-year cycle.

Appendix B. Summary of Municipal Electric Utility Reports Pursuant to Rule 25-6.0343, F.A.C. – Calendar Year 2017

Utility	The extent to which Standards of construction address:					Transmission & Distribution Facility Inspections				Vegetation Management Plan (VMP)	
	Guided by Extreme Wind Loading per Figure 250-2(d)		Effects of flooding & storm surges on UG and OH distribution facilities	Placement of distribution facilities to facilitate safe and efficient access	Written safety, pole reliability, pole loading capacity and engineering standards for attachments	Description of policies, guidelines, practices, procedures, cycles, and pole selection	Number and percent of poles and structures planned and completed	Number and percent of poles and structures failing inspections with reasons	Number and percent of poles and structures by class replaced or remediated with description	Description of policies, guidelines, practices, procedures, tree removals, with sufficient explanation	Quantity, level, and scope of planned and completed for transmission and distribution
	Major Planned Work Expansion, Rebuild or Relocation	Targeted Critical Infrastructures and major thoroughfares									
City of Jacksonville Beach d/b/a Beaches Energy Services	Yes. BES has a program in place where all OH distribution lines, roughly three city blocks inland of the Atlantic Ocean, will be replaced with UG conductors, pad mounted transformers, switches, and junction cabinets.	Yes. BES uses stronger concrete poles rather than wood poles and eliminates of static lines with shorter distribution structures to reduce moment loads on the structures. BES has a distribution wooden pole replacement program where BES will replace the wooden poles with concrete. To date, 664 concrete poles have been placed in service.	BES eliminated all exposed "live-front" connected transformers. The high voltage cables are connected to the transformers with sealed "dead front" elbows. Fiberglass foundations for pad mounted equipment have been replaced with thick heavy concrete foundations.	Yes. "Back lot line" construction has been eliminated, all electric kWh meters are located outside & near the front corner of buildings, all replacement or new URD underground cables are being installed in conduits & have a plastic, jacketed sheath, & all pad mounted equipment located near buildings have minimum access clearance.	Yes	The transmission structure is inspected annual, which includes insulators, downguys, grounding, and pole integrity. The distribution poles are inspected on an eight-year cycle using sound and bore method for every wood pole. Poles 10 years old and older were treated at ground level for rot and decay.	424 (100%) transmission structure inspections were planned and completed. In 2017, 75 (1.4%) distribution poles were inspected.	No transmission structures failed the inspection. In 2017, no distribution structures failed inspection.	No transmission structures failed the inspection. In 2017, no poles were replaced.	The transmission line rights of way are mowed and maintained annually. Tree trimming crews work year round to maintain a two to three year VMP cycle for transmission and distribution lines.	All vegetation management activities for 2017 have been fully completed and the vegetation management activities for 2018 are on schedule.

Appendix B. Summary of Municipal Electric Utility Reports Pursuant to Rule 25-6.0343, F.A.C. – Calendar Year 2017

	The extent to which Standards of construction address:					Transmission & Distribution Facility Inspections				Vegetation Management Plan (VMP)	
	Guided by Extreme Wind Loading per Figure 250-2(d)										
Utility	Major Planned Work Expansion, Rebuild or Relocation	Targeted Critical Infrastructures and major thoroughfares	Effects of flooding & storm surges on UG and OH distribution facilities	Placement of distribution facilities to facilitate safe and efficient access	Written safety, pole reliability, pole loading capacity and engineering standards for attachments	Description of policies, guidelines, practices, procedures, cycles, and pole selection	Number and percent of poles and structures planned and completed	Number and percent of poles and structures failing inspections with reasons	Number and percent of poles and structures by class replaced or remediated with description	Description of policies, guidelines, practices, procedures, tree removals, with sufficient explanation	Quantity, level, and scope of planned and completed for transmission and distribution
Blountstown, City of	Yes	Yes. The City of Blountstown adopted a larger minimum pole standard of a Class 3 pole in 2007 in an effort to harden facilities.	The City does not have any underground facilities. The City is looking at measures to flood proof substation.	Yes	No. Guidelines do not include written safety, pole reliability, pole loading, capacity and engineering standards and procedures for attachments by others to the transmission and distribution poles.	The City owns 1,947 utility poles and does visual inspections of all poles once a year.	100% of all poles are visually inspected annually.	29 (1.5%) poles required replacement because of ground rot, extreme cracking and warping and upgrading the lines. The City also reconductored about 3,200 linear feet of distribution line.	29 Class 5 poles were replaced with Class 3 poles.	The City has a four-year tree trimming cycle with 10-foot clearance of lines and facilities. The City has policies to remove dead, dying, or problematic trees before damage occurs.	The City will trim 25% of the system with a 10 foot clearance in 2018.

Appendix B. Summary of Municipal Electric Utility Reports Pursuant to Rule 25-6.0343, F.A.C. – Calendar Year 2017

	The extent to which Standards of construction address:					Transmission & Distribution Facility Inspections				Vegetation Management Plan (VMP)	
	Guided by Extreme Wind Loading per Figure 250-2(d)										
Utility	Major Planned Work Expansion, Rebuild or Relocation	Targeted Critical Infrastructures and major thoroughfares	Effects of flooding & storm surges on UG and OH distribution facilities	Placement of distribution facilities to facilitate safe and efficient access	Written safety, pole reliability, pole loading capacity and engineering standards for attachments	Description of policies, guidelines, practices, procedures, cycles, and pole selection	Number and percent of poles and structures planned and completed	Number and percent of poles and structures failing inspections with reasons	Number and percent of poles and structures by class replaced or remediated with description	Description of policies, guidelines, practices, procedures, tree removals, with sufficient explanation	Quantity, level, and scope of planned and completed for transmission and distribution
Bushnell, City of	Yes	Yes	Non-coastal utility; therefore storm surge is not an issue.	Yes	No written policy. All existing attachments inspected as part of the City's pole program initiated in 2007. An attachment audit was completed in 2016 to verify the current number and location of existing attachments.	The City has no transmission facilities. All distribution poles are on a seven-year cycle. The inspection includes visual, sound/bore, pole condition, and wind loading.	In 2017, the City inspected 297 poles.	Of the poles inspected in 2017, 27 poles failed. The reasons for the failures were upper roof rot, split top, and ground rot.	Of the 27 poles that failed inspections, to date, none have been replaced.	Tree removal, power line trim, and rights of way clearing are on a three-year cycle. Annual trimming is performed before hurricane season. Distribution lines not located on rights of way are trimmed on an “as needed” basis.	PURC held a vegetation management conference March 2007. Through Florida Municipal Electric Association, the City has a copy of the report and will use the information to continually improve vegetation management practices.

Appendix B. Summary of Municipal Electric Utility Reports Pursuant to Rule 25-6.0343, F.A.C. – Calendar Year 2017

	The extent to which Standards of construction address:					Transmission & Distribution Facility Inspections				Vegetation Management Plan (VMP)	
	Guided by Extreme Wind Loading per Figure 250-2(d)										
Utility	Major Planned Work Expansion, Rebuild or Relocation	Targeted Critical Infrastructures and major thoroughfares	Effects of flooding & storm surges on UG and OH distribution facilities	Placement of distribution facilities to facilitate safe and efficient access	Written safety, pole reliability, pole loading capacity and engineering standards for attachments	Description of policies, guidelines, practices, procedures, cycles, and pole selection	Number and percent of poles and structures planned and completed	Number and percent of poles and structures failing inspections with reasons	Number and percent of poles and structures by class replaced or remediated with description	Description of policies, guidelines, practices, procedures, tree removals, with sufficient explanation	Quantity, level, and scope of planned and completed for transmission and distribution
Chattahoochee, City of	Yes	Yes	Non-coastal utility; therefore storm surge is not an issue.	Yes	Yes	The distribution facilities are on a three-year cycle inspection using visual, excavation around base, sounding, and probing with steel rod. The City does not have any transmission facilities.	1,957 distribution poles were inspected in January 2018.	In 2018, 53 (2.7%) poles failed the inspection due to ground line and pole top decay.	In 2018, the City replaced 53 poles ranging from 30 feet to 45 feet, Class 4 to 6.	The City trims the distribution system on an annual basis. This cuts down on animal outages by limiting their pathways to poles and conductors.	The 2007 and 2009 PURC workshops reports are used to improve vegetation management.

Appendix B. Summary of Municipal Electric Utility Reports Pursuant to Rule 25-6.0343, F.A.C. – Calendar Year 2017

	The extent to which Standards of construction address:					Transmission & Distribution Facility Inspections				Vegetation Management Plan (VMP)	
	Guided by Extreme Wind Loading per Figure 250-2(d)										
Utility	Major Planned Work Expansion, Rebuild or Relocation	Targeted Critical Infrastructures and major thoroughfares	Effects of flooding & storm surges on UG and OH distribution facilities	Placement of distribution facilities to facilitate safe and efficient access	Written safety, pole reliability, pole loading capacity and engineering standards for attachments	Description of policies, guidelines, practices, procedures, cycles, and pole selection	Number and percent of poles and structures planned and completed	Number and percent of poles and structures failing inspections with reasons	Number and percent of poles and structures by class replaced or remediated with description	Description of policies, guidelines, practices, procedures, tree removals, with sufficient explanation	Quantity, level, and scope of planned and completed for transmission and distribution
Clewiston, City of	Yes	Yes	Non-coastal utility; therefore storm surge is not an issue.	Yes	The City does not have standard guidelines for pole attachments as all attachments are reviewed by engineers, and place all new construction underground.	The facilities are on a five-year inspection cycle, which began in 2014, using sound, prod and visual inspections. The City performs infrared inspections on the facilities on a three- to four-year cycle.	In 2017, 640 (40%) poles were scheduled for inspection and 445 (67%) poles were inspected.	33 (8%) poles failed inspection due to pole rot.	All of the City's transmission poles are concrete. In 2017, the City replaced 23 - 40 foot distribution poles previously identified. The 33 poles failing the 2017 inspection were Class 4 and 5 poles and are scheduled for replacement in the near future.	The City has a City ordinance that prohibits planting in easements. 100% of the distribution system is inspected annually for excessive tree growth. The City trims the entire system continuously as needed. The City will also accept requests from customers for tree trimming.	All transmission and feeders checked and trimmed in 2017 as every year, and the City completed 54 customer requests for tree trimming.

Appendix B. Summary of Municipal Electric Utility Reports Pursuant to Rule 25-6.0343, F.A.C. – Calendar Year 2017

	The extent to which Standards of construction address:					Transmission & Distribution Facility Inspections				Vegetation Management Plan (VMP)	
	Guided by Extreme Wind Loading per Figure 250-2(d)										
Utility	Major Planned Work Expansion, Rebuild or Relocation	Targeted Critical Infrastructures and major thoroughfares	Effects of flooding & storm surges on UG and OH distribution facilities	Placement of distribution facilities to facilitate safe and efficient access	Written safety, pole reliability, pole loading capacity and engineering standards for attachments	Description of policies, guidelines, practices, procedures, cycles, and pole selection	Number and percent of poles and structures planned and completed	Number and percent of poles and structures failing inspections with reasons	Number and percent of poles and structures by class replaced or remediated with description	Description of policies, guidelines, practices, procedures, tree removals, with sufficient explanation	Quantity, level, and scope of planned and completed for transmission and distribution
Fort Meade, City of	Yes	Yes	The current procedures address flooding & storm surges. Participant in PURC study on conversion of OH to UG.	Yes	Yes	The City's facilities are on an eight-year cycle using visual and sound and probe technique.	The City has distribution lines only. The City replaced 67 poles in 2017. 30 poles were due to Hurricane Irma.	The City has approximately 2,750 dist. poles. Of those poles 25 (1%) poles failed inspection. The poles failed inspection due to age deterioration & animal infestation.	The City replaced 67 (2.4%) poles with poles ranging from 55 feet to 30 feet, Class 5 to Class 3.	The facilities are on a three-year inspection cycle, and have a low outage rate due to problem vegetation.	The City has completed approximately 30% of trimming. The city reported 122 outages in 2017, with 20% (24) due to vegetation.

Appendix B. Summary of Municipal Electric Utility Reports Pursuant to Rule 25-6.0343, F.A.C. – Calendar Year 2017

	The extent to which Standards of construction address:					Transmission & Distribution Facility Inspections				Vegetation Management Plan (VMP)	
	Guided by Extreme Wind Loading per Figure 250-2(d)										
Utility	Major Planned Work Expansion, Rebuild or Relocation	Targeted Critical Infrastructures and major thoroughfares	Effects of flooding & storm surges on UG and OH distribution facilities	Placement of distribution facilities to facilitate safe and efficient access	Written safety, pole reliability, pole loading capacity and engineering standards for attachments	Description of policies, guidelines, practices, procedures, cycles, and pole selection	Number and percent of poles and structures planned and completed	Number and percent of poles and structures failing inspections with reasons	Number and percent of poles and structures by class replaced or remediated with description	Description of policies, guidelines, practices, procedures, tree removals, with sufficient explanation	Quantity, level, and scope of planned and completed for transmission and distribution
Fort Pierce Utilities Authority	Yes	Yes	Yes. FPUA references FEMA 100 Year Flood Zone for pad mounted equipment installation and alternatively, may elect to install fully submersible equipment as deemed necessary.	Yes	Yes	FPUA utilizes a contractor to perform inspection of all wood distribution and transmission poles on an eight-year cycle. The inspection includes visual inspection from ground line to the top and some excavation is performed on older poles.	3,000 distribution and 100 transmission poles were planned for inspection in 2017. 3,404 distribution and 29 transmission poles were inspected in 2017 indicating 16.9% were inspected.	No transmission pole failed inspection in 2017. 140 (4.1%) distribution pole failed inspection in 2017. 139 failures are non-priority because the calculated strength fell below 67% due to decay at ground line but had sufficient integrity for reinforcement.	FPUA replaced 182 wood distribution poles in 2017. 140 poles were from the 2017 inspection and 42 poles were from earlier inspections.	FPUA maintains a three-year VM cycle for transmission and distribution system with a goal of maintaining foliage cut back at a minimum to a three-year level. FPUA also aggressively seeks to remove problem trees when trimming is not an effective option.	FPUA spent $330,000 for the trimming, removal and disposal of vegetation waste in fiscal year 2017, which was sufficient to meet the yearly target of addressing one-third of the system.

Appendix B. Summary of Municipal Electric Utility Reports Pursuant to Rule 25-6.0343, F.A.C. – Calendar Year 2017

	The extent to which Standards of construction address:					Transmission & Distribution Facility Inspections				Vegetation Management Plan (VMP)	
	Guided by Extreme Wind Loading per Figure 250-2(d)										
Utility	Major Planned Work Expansion, Rebuild or Relocation	Targeted Critical Infrastructures and major thoroughfares	Effects of flooding & storm surges on UG and OH distribution facilities	Placement of distribution facilities to facilitate safe and efficient access	Written safety, pole reliability, pole loading capacity and engineering standards for attachments	Description of policies, guidelines, practices, procedures, cycles, and pole selection	Number and percent of poles and structures planned and completed	Number and percent of poles and structures failing inspections with reasons	Number and percent of poles and structures by class replaced or remediated with description	Description of policies, guidelines, practices, procedures, tree removals, with sufficient explanation	Quantity, level, and scope of planned and completed for transmission and distribution
Gainesville Regional Utilities	Yes	Yes	Non-coastal utility; therefore storm surge is not an issue.	Yes; GRU has instituted a Continuous Improvement Program, which identifies the worst performing devices, circuits and most compromised primary voltage underground cable.	Yes	The facility are on an eight-year cycle for all lines and includes visual, sound, and bore, and below ground line inspection to 18 inches around the base of each pole.	One transmission pole was scheduled for inspection in 2017. GRU planned 4,295 distribution pole inspections and completed 4,296 (100%) inspections.	No transmission poles were planned or identified for replacement. 46 (1.1%) distribution poles failed due to shell rot, internal decay, and decayed tops.	46 (1.1%) distribution poles were replaced in 2017, ranging in size from 30 feet to 55 feet Class 3 to Class 7.	The VMP includes 560 miles of overhead distribution lines on a three-year cycle. The VMP includes an herbicide program and standards from NESC, ANSI A300, and Shigo-Tree Pruning.	The VMP is an on going and year round program. 100% of the transmission facilities were inspected in 2017, with 54 trees identified for trimming and /or removal. 200 distribution circuit miles were trimmed in 2017.

Appendix B. Summary of Municipal Electric Utility Reports Pursuant to Rule 25-6.0343, F.A.C. – Calendar Year 2017

	The extent to which Standards of construction address:					Transmission & Distribution Facility Inspections				Vegetation Management Plan (VMP)	
	Guided by Extreme Wind Loading per Figure 250-2(d)										
Utility	Major Planned Work Expansion, Rebuild or Relocation	Targeted Critical Infrastructures and major thoroughfares	Effects of flooding & storm surges on UG and OH distribution facilities	Placement of distribution facilities to facilitate safe and efficient access	Written safety, pole reliability, pole loading capacity and engineering standards for attachments	Description of policies, guidelines, practices, procedures, cycles, and pole selection	Number and percent of poles and structures planned and completed	Number and percent of poles and structures failing inspections with reasons	Number and percent of poles and structures by class replaced or remediated with description	Description of policies, guidelines, practices, procedures, tree removals, with sufficient explanation	Quantity, level, and scope of planned and completed for transmission and distribution
Green Cove Springs, City of	Yes	Yes	Yes, all facilities are installed a minimum 8 inches above the roadway.	Yes	Yes	The City does not have transmission lines as defined by 69kV and above. The City is continuing to evaluate the benefits of an inspection program versus accomplishing the same activity during capital improvement programs. The City completed converting 4.1 kV lines to 13.2 kV in 2017.	The City visually inspects any distribution pole it interfaces with under normal maintenance workflow patterns. In 2017, the City initiated a third-party inspection of over 1,000 poles. By the end of 2018, the City estimates 98 percent of its poles will be inspected.	In 2017, five (6%) wood distribution poles were replaced. The poles failed visual inspection due to rot.	The poles that were replaced ranged from 30 feet to 45 feet, all Class 3.	The City contracts annually to trim 100% of the system three-phase primary circuits including all sub-transmission and distribution feeder facilities. Problem trees are trimmed and removed as identified.	100% of system was trimmed in 2017. PURC held two vegetation management workshops in 2007 and 2009 and the City has a copy of the report and will use the information.

Appendix B. Summary of Municipal Electric Utility Reports Pursuant to Rule 25-6.0343, F.A.C. – Calendar Year 2017

	The extent to which Standards of construction address:					Transmission & Distribution Facility Inspections				Vegetation Management Plan (VMP)	
	Guided by Extreme Wind Loading per Figure 250-2(d)										
Utility	Major Planned Work Expansion, Rebuild or Relocation	Targeted Critical Infrastructures and major thoroughfares	Effects of flooding & storm surges on UG and OH distribution facilities	Placement of distribution facilities to facilitate safe and efficient access	Written safety, pole reliability, pole loading capacity and engineering standards for attachments	Description of policies, guidelines, practices, procedures, cycles, and pole selection	Number and percent of poles and structures planned and completed	Number and percent of poles and structures failing inspections with reasons	Number and percent of poles and structures by class replaced or remediated with description	Description of policies, guidelines, practices, procedures, tree removals, with sufficient explanation	Quantity, level, and scope of planned and completed for transmission and distribution
Havana, Town of	Yes	No. Participating in PURC granular wind research study through the Florida Municipal Electric Assoc.	Non-coastal utility; therefore storm surge is not an issue	Yes	Yes	Total system is 1,173 poles; inspected several times annually using sound and probe method.	100% planned and completed in 2017.	5 (0.43%) poles failed inspection.	Three 35 foot, Class 4 poles and two 40 foot, Class 4 poles for a total of five were replaced.	Written policy requires one-third of entire system trimmed annually.	33% of the system was trimmed in 2017.

Appendix B. Summary of Municipal Electric Utility Reports Pursuant to Rule 25-6.0343, F.A.C. – Calendar Year 2017

	The extent to which Standards of construction address:					Transmission & Distribution Facility Inspections				Vegetation Management Plan (VMP)	
	Guided by Extreme Wind Loading per Figure 250-2(d)										
Utility	Major Planned Work Expansion, Rebuild or Relocation	Targeted Critical Infrastructures and major thoroughfares	Effects of flooding & storm surges on UG and OH distribution facilities	Placement of distribution facilities to facilitate safe and efficient access	Written safety, pole reliability, pole loading capacity and engineering standards for attachments	Description of policies, guidelines, practices, procedures, cycles, and pole selection	Number and percent of poles and structures planned and completed	Number and percent of poles and structures failing inspections with reasons	Number and percent of poles and structures by class replaced or remediated with description	Description of policies, guidelines, practices, procedures, tree removals, with sufficient explanation	Quantity, level, and scope of planned and completed for transmission and distribution
Homestead Energy Services	Yes	Yes	Yes. Participating in PURC's study on the conversion of overhead to underground facilities through Florida Municipal Electric Association.	Yes	Yes	All transmission poles concrete. A drone thermographic inspection of all the transmission lines was completed in 2017. The distribution facilities are on an eight-year cycle using sound and bore and loading evaluations and the annual thermographic inspection was completed May 2017.	Entire transmission system was inspected in 2017. Approximately 15% of the distribution poles were inspected during 2016/2017 fiscal year.	2 (1.5%) transmission poles of the 135 poles inspected failed inspection due to cracks in the concrete top. 101 (2.1%) distribution poles of the 4,713 poles inspected failed inspections due to ground rot, upper roof rot and split tops. In addition, following Hurricane Irma, 162 wooden poles were replaced due to vegetation, high winds, or poles failing previous inspections but not yet addressed.	The two transmission poles are scheduled for remediation in 2018. Based on the results of the 2016 and 2017 inspections, HES removed 5 poles, reworked 6 poles, transferred facilities to 1 storm hardened pole, installed two 55 foot Class 3 poles, replaced four 35 foot Class 4, twelve 40 foot Class 3, five 40 foot Class 3, and sixteen 45 foot Class 3 poles.	Trimming services are contracted out and entire system is trimmed on a two-year cycle. HES added an additional tree trimming crew at the end of 2016. There are no issues for transmission facilities.	HES enacted code changes, which require property owners to keep vegetation trimmed to maintain 6-feet of clearance from city utilities.

Appendix B. Summary of Municipal Electric Utility Reports Pursuant to Rule 25-6.0343, F.A.C. – Calendar Year 2017

	The extent to which Standards of construction address:					Transmission & Distribution Facility Inspections				Vegetation Management Plan (VMP)	
	Guided by Extreme Wind Loading per Figure 250-2(d)										
Utility	Major Planned Work Expansion, Rebuild or Relocation	Targeted Critical Infrastructures and major thoroughfares	Effects of flooding & storm surges on UG and OH distribution facilities	Placement of distribution facilities to facilitate safe and efficient access	Written safety, pole reliability, pole loading capacity and engineering standards for attachments	Description of policies, guidelines, practices, procedures, cycles, and pole selection	Number and percent of poles and structures planned and completed	Number and percent of poles and structures failing inspections with reasons	Number and percent of poles and structures by class replaced or remediated with description	Description of policies, guidelines, practices, procedures, tree removals, with sufficient explanation	Quantity, level, and scope of planned and completed for transmission and distribution
JEA	Yes	Yes	Yes. Currently has written Storm Policy and associated procedures addressed for Category 3 storms or greater.	Yes	Yes	Transmission circuits are on a 5-year cycle, except for the critical N-1 240kV, which is on a 2-year cycle. Distribution poles are on an eight-year inspection cycle, using sound and bore with excavation.	26 transmission circuits (which includes many poles on each circuit) and 25 distribution circuits were inspected in 2017.	Based on 2017 inspection: 34 (14%) transmission wooden poles failed inspection. Based on 2017 inspection: 6.5% distribution poles failed inspection due to ground decay, pole top decay, and middle decay.	In 2017, 21 transmission wood poles and 193 distribution poles were replaced. The poles listed as emergency poles (under 1%) are replaced immediately. Two poles failing the 2017 inspections were listed as emergency poles.	The transmission facilities are in accordance with NERC FAC-003-1. The distribution facilities are on a 2.5-year trim cycle as requested by their customers to improve reliability.	JEA fully completed all 2017 VM activities and is fully compliant with NERC standard for vegetation management. VMP activities are on schedule for 2018.

Appendix B. Summary of Municipal Electric Utility Reports Pursuant to Rule 25-6.0343, F.A.C. – Calendar Year 2017

	The extent to which Standards of construction address:					Transmission & Distribution Facility Inspections				Vegetation Management Plan (VMP)	
	Guided by Extreme Wind Loading per Figure 250-2(d)										
Utility	Major Planned Work Expansion, Rebuild or Relocation	Targeted Critical Infrastructures and major thoroughfares	Effects of flooding & storm surges on UG and OH distribution facilities	Placement of distribution facilities to facilitate safe and efficient access	Written safety, pole reliability, pole loading capacity and engineering standards for attachments	Description of policies, guidelines, practices, procedures, cycles, and pole selection	Number and percent of poles and structures planned and completed	Number and percent of poles and structures failing inspections with reasons	Number and percent of poles and structures by class replaced or remediated with description	Description of policies, guidelines, practices, procedures, tree removals, with sufficient explanation	Quantity, level, and scope of planned and completed for transmission and distribution
Keys Energy Services, City of Key West	Yes	Yes	Yes	Yes. The KEYS will ensure all future construction occurs adjacent to public roads, will relocate all primary high voltage facilities that are currently inaccessible over a three-year period, and will develop a multi-year program to relocate all secondary facilities that are currently inaccessible.	Yes	The Keys does not have any wooden transmission poles. The concrete and metal transmission poles are inspected every two years by helicopter and infrared survey. 100% of the distribution poles were inspected in 2015 by Osmose, Inc.	An inspection of all transmission facilities was done in 2014. From the 2015 inspection, 5,823 concrete poles, 6,616 wooden, and 6 other type of distribution poles were inspected.	No transmission poles failed inspection. 70 (1.2%) concrete poles and 484 (7.3%) wooden poles failed inspection in 2015. The reasons for the failures are decayed top, excessive cracking, excessive spur cuts, hollow, mechanical damage, rotten ground rot, ground shell rot, wind shake, wood borers, woodpecker holes.	No transmission facilities failed inspection. The KEYS bid out the project of replacing 485 poles with storm harden facilities. The KEYS approved a multi-year contract to manufacture 485 new ductile iron poles. 257 of the 485 poles have been replaced. Due to Hurricane Irma, 519 poles were replaced in 2017.	The Keys' 241 miles 3 phase distribution lines are on a two-year trim cycle and 68 miles of transmission lines are a quarterly cycle. The Keys tree crews remove all invasive trees in the rights of way and easements. The trees are cut to ground level and sprayed with an herbicide to prevent re-growth.	In 2017, the Keys had 3 recloser outages, 5 feeder outages, and 9 lateral outages due to trees. The Keys will strive to continue to improve its VMP to further reduce outages.

Appendix B. Summary of Municipal Electric Utility Reports Pursuant to Rule 25-6.0343, F.A.C. – Calendar Year 2017

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	Guided by Extreme Wind Loading per Figure 250-2(d)										
Utility	Major Planned Work Expansion, Rebuild or Relocation	Targeted Critical Infrastructures and major thoroughfares	Effects of flooding & storm surges on UG and OH distribution facilities	Placement of distribution facilities to facilitate safe and efficient access	Written safety, pole reliability, pole loading capacity and engineering standards for attachments	Description of policies, guidelines, practices, procedures, cycles, and pole selection	Number and percent of poles and structures planned and completed	Number and percent of poles and structures failing inspections with reasons	Number and percent of poles and structures by class replaced or remediated with description	Description of policies, guidelines, practices, procedures, tree removals, with sufficient explanation	Quantity, level, and scope of planned and completed for transmission and distribution
Kissimmee Utility Authority	Yes	Yes	Non-coastal utility; therefore storm surge is not an issue. Low areas susceptible to flooding have been identified and are monitored.	Yes	Yes	All transmission and distribution inspections are outsourced to experienced pole inspector who utilizes sound and bore and ground-line excavation method for all wood poles. Transmission poles are inspected on a three-year cycle and distribution poles are inspected on an eight-year cycle.	109 transmission poles were inspected in 2017. 2,488 distribution poles were inspected in 2017, which is 17.3% of the system.	4 (0.002%) distribution poles failed inspection due to split top and shell rot. No new failures were identified during the transmission inspection.	No transmission poles were replaced and three distribution poles were replaced in 2017. The distribution poles were 30 to 40 feet and Classes 3 to 6.	KUA has a written Transmission Vegetation Management Plan (TVMT) where it conducts visual inspection of all transmission lines semi-annually. The guidelines for KUA's distribution facilities are on a three-year trim cycle.	100% required remediation during the transmission facilities inspection was completed in 2017. Approximately 104.1 miles (33%) of distribution facilities were inspected and remediated in 2017.

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Utility	Major Planned Work Expansion, Rebuild or Relocation	Targeted Critical Infrastructures and major thoroughfares	Effects of flooding & storm surges on UG and OH distribution facilities	Placement of distribution facilities to facilitate safe and efficient access	Written safety, pole reliability, pole loading capacity and engineering standards for attachments	Description of policies, guidelines, practices, procedures, cycles, and pole selection	Number and percent of poles and structures planned and completed	Number and percent of poles and structures failing inspections with reasons	Number and percent of poles and structures by class replaced or remediated with description	Description of policies, guidelines, practices, procedures, tree removals, with sufficient explanation	Quantity, level, and scope of planned and completed for transmission and distribution
Lake Worth Utilities, City of	Yes	The facilities are not designed to be guided by the extreme loading standards on a system wide basis. However, CLW is guided by the extreme wind-loading standard for new construction, major planned work, etc. after December 10, 2006.	Underground distribution construction practices require installation of dead front pad mounted equipment in areas susceptible to flooding.	Yes	Yes	Visual inspections are performed on all CLW transmission facilities on an annual basis. The transmission poles are concrete and steel. CLW performs an inspection of the distribution facilities on an eight-year cycle. Pole tests include hammer sounding and pole prod penetration 6 inches below ground.	In 2017, CLW inspected 640 poles.	102 poles were deemed unsatisfactory in 2017. Poles are replaced when pole prod penetration exceeds 2 inches or there is evidence of pole top shell rot.	CLW replaced 82 poles in 2017, with 20 poles pending replacement.	CLW has an on-going VMP on a system wide, two-year cycle. Minimum clearance of 10 feet in any direction from CLW conductors is obtained.	Contractor attempts to get property owners permission to remove trees which are dead or defective and are a hazard; fast growing soft-wooded or weed trees, small trees which do not have value but will require trimming in the future, tress that are unsightly as a result of trimming and have no chance for future development, and trees that are non native and invasive.

Appendix B. Summary of Municipal Electric Utility Reports Pursuant to Rule 25-6.0343, F.A.C. – Calendar Year 2017

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	Guided by Extreme Wind Loading per Figure 250-2(d)										
Utility	Major Planned Work Expansion, Rebuild or Relocation	Targeted Critical Infrastructures and major thoroughfares	Effects of flooding & storm surges on UG and OH distribution facilities	Placement of distribution facilities to facilitate safe and efficient access	Written safety, pole reliability, pole loading capacity and engineering standards for attachments	Description of policies, guidelines, practices, procedures, cycles, and pole selection	Number and percent of poles and structures planned and completed	Number and percent of poles and structures failing inspections with reasons	Number and percent of poles and structures by class replaced or remediated with description	Description of policies, guidelines, practices, procedures, tree removals, with sufficient explanation	Quantity, level, and scope of planned and completed for transmission and distribution
Lakeland Electric	Yes	Yes. For all pole heights 60 feet and above; and meet or exceed Grade B construction below this height.	Non-coastal utility; therefore storm surge is not an issue.	Yes	Yes	The facilities are on an eight-year inspection cycle using visual, sound and bore, with ground line excavation and in addition; visual inspection during normal course of daily activities. Lakeland Electric initiated its second eight-year cycle in 2017.	There were 81 (12.5%) transmission poles planned for inspection and 71 (11%) were completed. There were 7,080 (12.5%) distribution poles planned for inspection and 7,197 (12.7%) completed.	4 (5.6%) transmission poles failed inspection due to decay. 486 (6.89%) distribution poles failed inspection due to decay.	All poles recommended in 2017 were assessed for appropriate action. 607 distribution poles were replaced, repaired, or removed in 2017. 1,849 distribution poles were deferred to 2018. 29 transmission poles were repaired or replaced in 2017 and 44 replacements were deferred to 2018.	The facilities are on a three-year inspection cycle for transmission and distribution circuits. VMP also provides in between cycle trim to enhance reliability.	17.6 miles of 230kV transmission lines were inspected in 2017. 14.36 miles of 69 kV transmission lines were inspected in 2017. LE completed 253 of the planned 400 miles of distribution lines for 2017.

Appendix B. Summary of Municipal Electric Utility Reports Pursuant to Rule 25-6.0343, F.A.C. – Calendar Year 2017

	The extent to which Standards of construction address:					Transmission & Distribution Facility Inspections				Vegetation Management Plan (VMP)	
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Utility	Major Planned Work Expansion, Rebuild or Relocation	Targeted Critical Infrastructures and major thoroughfares	Effects of flooding & storm surges on UG and OH distribution facilities	Placement of distribution facilities to facilitate safe and efficient access	Written safety, pole reliability, pole loading capacity and engineering standards for attachments	Description of policies, guidelines, practices, procedures, cycles, and pole selection	Number and percent of poles and structures planned and completed	Number and percent of poles and structures failing inspections with reasons	Number and percent of poles and structures by class replaced or remediated with description	Description of policies, guidelines, practices, procedures, tree removals, with sufficient explanation	Quantity, level, and scope of planned and completed for transmission and distribution
Leesburg, City of	Yes	Yes. Participation in PURC granular wind research study through the Florida Municipal Electric Assoc.	Leesburg is approximately 60 miles inland from the Atlantic and Gulf coasts and is not subject to major flooding or storm surge.	Yes	Yes. Foreign utility attachments are inspected on an eight-year cycle.	No transmission facilities. The Distribution facilities are on an eight-year cycle using visual, sound/bore, excavation method, and ground level strength test.	2,082 poles were inspected in 2017. The current inspection cycle was started in 2017.	178 (6.3%) poles failed inspection due to. but not limited to ground line rot, woodpecker damage, and other damage.	During 2017, 89 poles were replaced that failed inspection. The City also replaced 181 poles due to decayed tops and pole loading.	Four-year trim cycle for feeder and lateral circuits. Problem trees are trimmed or removed as identified.	In 2017, 48.5 miles of distribution lines were trimmed as planned.

Appendix B. Summary of Municipal Electric Utility Reports Pursuant to Rule 25-6.0343, F.A.C. – Calendar Year 2017

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Utility	Major Planned Work Expansion, Rebuild or Relocation	Targeted Critical Infrastructures and major thoroughfares	Effects of flooding & storm surges on UG and OH distribution facilities	Placement of distribution facilities to facilitate safe and efficient access	Written safety, pole reliability, pole loading capacity and engineering standards for attachments	Description of policies, guidelines, practices, procedures, cycles, and pole selection	Number and percent of poles and structures planned and completed	Number and percent of poles and structures failing inspections with reasons	Number and percent of poles and structures by class replaced or remediated with description	Description of policies, guidelines, practices, procedures, tree removals, with sufficient explanation	Quantity, level, and scope of planned and completed for transmission and distribution
Moore Haven, City of	Yes	At this time, the facilities are not designed to be guided by the extreme loading standards on a system wide basis. The City is participating in PURC granular wind research study through Florida Municipal Electric Assoc.	Non-coastal utility; therefore storm surge is not an issue.	Yes	Yes	The City inspects all the distribution facilities annually by visual and sound inspections.	The City continuously inspected the distribution facilities in 2017. The City is one square mile and easily inspected during routine activities. The City does not own any transmission facilities. The City is upgrading its 3 Phase poles.	The City is working on the rear-of secondary, making them more accessible. The City has approximately 410 poles in the distribution system and streetlights.	The City replaced eight 30-foot poles, seven 35-foot poles, and, twenty-three 40-foot poles.	The City is continuous tree trimming in easements and rights of way. 100% of distribution system is trimmed each year.	The City expended approximately 20% of Electric Dept. Resources to vegetation management. All vegetation management is performed in house.

Appendix B. Summary of Municipal Electric Utility Reports Pursuant to Rule 25-6.0343, F.A.C. – Calendar Year 2017

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Utility	Major Planned Work Expansion, Rebuild or Relocation	Targeted Critical Infrastructures and major thoroughfares	Effects of flooding & storm surges on UG and OH distribution facilities	Placement of distribution facilities to facilitate safe and efficient access	Written safety, pole reliability, pole loading capacity and engineering standards for attachments	Description of policies, guidelines, practices, procedures, cycles, and pole selection	Number and percent of poles and structures planned and completed	Number and percent of poles and structures failing inspections with reasons	Number and percent of poles and structures by class replaced or remediated with description	Description of policies, guidelines, practices, procedures, tree removals, with sufficient explanation	Quantity, level, and scope of planned and completed for transmission and distribution
Mount Dora, City of	The City retained an engineering firm and developed construction standards for 12 kV distribution poles.	Yes	Non-coastal utility; therefore storm surge is not an issue.	Yes	A new construction standard was developed to use guy wires for all levels on poles. The standards for poles that the City developed in 2012 reflect the impact of pole attachments on pole loading capacity.	The City does not own any transmission lines. Distribution lines and structures are visually inspected for cracks and a sounding technique used to determine rot annually. The City engaged a contractor to inspect and treat all wood poles on December 5, 2017. The project is expected to be completed in March 2018.	The City completed 100% of planned distribution inspections in 2017.	The City had 33 distribution poles in 2017 that failed inspection. The reasons for the failures were tree trimming needed, remove vegetation, loose or missing guy, damaged or missing guy guard, rotten or damaged pole, missing or damaged squirrel guard, insulators or grounds, blown lightning arrestor, and damaged pole attachment.	The city had 1,799 wooden poles as of January 1, 2017. The City's table shows 19 wooden poles were replaced. The wooden replaced range from 30 foot to 45 foot. The wooden poles were replaced with 30 to 55 feet concrete, fiberglass, or steel poles.	An outside contractor working two crews 40 hours per week completes tree trimming on a 12-month cycle.	The City trimmed trees on a 12-month cycle, and removed limbs from trees in rights of way and easements that could create clearance problems.

Appendix B. Summary of Municipal Electric Utility Reports Pursuant to Rule 25-6.0343, F.A.C. – Calendar Year 2017

	The extent to which Standards of construction address:					Transmission & Distribution Facility Inspections				Vegetation Management Plan (VMP)	
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Utility	Major Planned Work Expansion, Rebuild or Relocation	Targeted Critical Infrastructures and major thoroughfares	Effects of flooding & storm surges on UG and OH distribution facilities	Placement of distribution facilities to facilitate safe and efficient access	Written safety, pole reliability, pole loading capacity and engineering standards for attachments	Description of policies, guidelines, practices, procedures, cycles, and pole selection	Number and percent of poles and structures planned and completed	Number and percent of poles and structures failing inspections with reasons	Number and percent of poles and structures by class replaced or remediated with description	Description of policies, guidelines, practices, procedures, tree removals, with sufficient explanation	Quantity, level, and scope of planned and completed for transmission and distribution
New Smyrna Beach Utilities Commission, City of	Yes	Yes	Yes. The City only installs stainless steel dead front pad mounted transformers in its system and existing pad mounted transformers are being upgraded to dead front stainless steel transformers.	Yes	Yes	The transmission and distribution facilities are on an eight-year inspection cycle. Additionally, distribution facilities are inspected as part of the City's normal maintenance when patrolling distribution facilities.	76 (18%) transmission poles were inspected during 2017. 1,500 (12.5%) distribution poles were inspected in 2017.	12 (15%) transmission poles were rejected in 2017 due to decay, slit top, and woodpecker damage. 116 (7.7%) distribution poles failed inspection due to decay, split top, and woodpecker damage.	No transmission poles were replaced in 2017. The City replaced/ repaired 51 distribution poles. The poles are sizes 30-50 feet and Class 3-5.	The City maintains three crews on continuous basis to do main feeder and hot spot trimming. The City mows its transmission lines on a yearly basis.	The City trimmed approximately 30% of distribution system in 2017, and performed clear cutting on 20% of the transmission lines.

Appendix B. Summary of Municipal Electric Utility Reports Pursuant to Rule 25-6.0343, F.A.C. – Calendar Year 2017

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Utility	Major Planned Work Expansion, Rebuild or Relocation	Targeted Critical Infrastructures and major thoroughfares	Effects of flooding & storm surges on UG and OH distribution facilities	Placement of distribution facilities to facilitate safe and efficient access	Written safety, pole reliability, pole loading capacity and engineering standards for attachments	Description of policies, guidelines, practices, procedures, cycles, and pole selection	Number and percent of poles and structures planned and completed	Number and percent of poles and structures failing inspections with reasons	Number and percent of poles and structures by class replaced or remediated with description	Description of policies, guidelines, practices, procedures, tree removals, with sufficient explanation	Quantity, level, and scope of planned and completed for transmission and distribution
Newberry, City of	Yes	Yes	Non-coastal utility; therefore storm surge is not an issue.	Yes	Yes	Distribution poles are inspected on an eight-year inspection cycle at ground line for deterioration, entire upper part of the pole for cracks, and soundness of upper part of pole.	The City inspected 196 (12.67%) of 1,560 the poles in 2017.	4 (2%) of the poles were rejected due to ground rot from the inspection in 2017.	Four distribution poles were replaced in 2017: all four wooden poles were Class 4 and varied from 35 to 40 foot with Class 3 40 foot poles.	The City trims all distribution lines on a three-year trim cycle, with attention given to problem trees during the same cycle. Problem trees not in the rights of way are addressed with the property owner.	One third of distribution facilities are trimmed each year to obtain a three-year cycle.

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Utility	Major Planned Work Expansion, Rebuild or Relocation	Targeted Critical Infrastructures and major thoroughfares	Effects of flooding & storm surges on UG and OH distribution facilities	Placement of distribution facilities to facilitate safe and efficient access	Written safety, pole reliability, pole loading capacity and engineering standards for attachments	Description of policies, guidelines, practices, procedures, cycles, and pole selection	Number and percent of poles and structures planned and completed	Number and percent of poles and structures failing inspections with reasons	Number and percent of poles and structures by class replaced or remediated with description	Description of policies, guidelines, practices, procedures, tree removals, with sufficient explanation	Quantity, level, and scope of planned and completed for transmission and distribution
Ocala Electric Utility, City of	Yes	Yes	Non-coastal utility; therefore storm surge is not an issue.	Yes	Yes	The City inspects its system on an eight-year inspection cycle, which include above ground inspection, sounding, boring, excavation, chipping, internal treatment, and evaluation of each pole to determine strength. 2015 is the first year in the second eight-year cycle.	No transmission poles were inspected in 2017, since 100% were inspected in 2015. The transmission poles will again be inspected in 2023, which is the beginning of the next cycle. 4,657 (14.4%) of the 32,369 wood distribution poles were inspected in 2017.	99 (2.1%) distribution poles failed inspection due to shell rot, decayed top, exposed pocket, and other reasons.	32 (0.7%) of the distribution poles were braced and 67 (1.4%) poles were replaced.	The City is on a four-year trim cycle for distribution and three-year cycle for transmission, with additional pruning over areas allowed minimal trimming. In 2013, an IVM style-pruning program was implemented which uses manual, mechanical, and chemical control methods for managing brush.	In 2017, the City trimmed one-fourth of the distribution system and one-third of the transmission system.

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	Major Planned Work Expansion, Rebuild or Relocation	Targeted Critical Infrastructures and major thoroughfares									
Orlando Utilities Commission, City Orlando	Yes	Yes	Non-coastal utility; therefore storm surge is not an issue.	Yes	Yes	OUC facilities are on an eight-year inspection cycle, which includes visual inspection, sounding & boring, excavation, removal of exterior decay, ground line and internal treatments.	OUC planned 6,200 (12%) inspection for distribution and transmission facilities and completed 6,389 (13%) inspections in 2017.	27 poles (0.4%) failed inspection. Failure causes include: decay and others.	2 poles were deemed priority replacement, 2 were completed. There are no poles pending restoration using reinforcing truss. The remaining 25 will be replaced in 2018 and 2019.	213 miles of transmission facilities are on a three-year trim cycle. 1,261 miles of distribution facilities are on a three-year trim cycle. OUC follows safety methods in ANSI A300 & Z133.1.	For 2017, 450 distribution miles were planned and 100% were completed. For 2017, 99 transmission miles were planned and 100% were completed.

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Utility	Major Planned Work Expansion, Rebuild or Relocation	Targeted Critical Infrastructures and major thoroughfares	Effects of flooding & storm surges on UG and OH distribution facilities	Placement of distribution facilities to facilitate safe and efficient access	Written safety, pole reliability, pole loading capacity and engineering standards for attachments	Description of policies, guidelines, practices, procedures, cycles, and pole selection	Number and percent of poles and structures planned and completed	Number and percent of poles and structures failing inspections with reasons	Number and percent of poles and structures by class replaced or remediated with description	Description of policies, guidelines, practices, procedures, tree removals, with sufficient explanation	Quantity, level, and scope of planned and completed for transmission and distribution
Quincy, City of	Yes	Yes	Non-coastal utility; therefore storm surge is not an issue	Yes	Yes	The City's pole inspection procedures include visual and sound and bore methods for an inspection cycle of eight years.	Visual inspections were carried out on all 2,869 distribution poles in 2017. Detailed inspections were carried out on all 31 transmission poles and 216 distribution poles for 2017. All transmission poles are made of concrete and found to be in good condition.	17 distribution poles (0.6%) failed inspection. The poles showed signs of rotting around the base of the pole or the top of the pole. The poles were replaced with wood poles. No transmission poles failed inspection.	17 distribution poles were replaced as follows: One 25 foot Class 7, five 30 foot Class 6, two 35 foot Class 3, four 40 foot Class 3, four 45 foot Class 3, and one 50 foot Class 3.	The City trims its electric system rights of way on a regular basis using in-house crews. The City strives to trim 25% of the system per year.	Approximately 24.8 miles (33.1%) of vegetation trimming was planned and completed on the distribution system in 2017. 100% of the City's transmission lines were inspected in 2017.

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Reedy Creek Improvement District	Yes. The District has less than 2 miles of overhead distribution lines and roughly 296 miles of underground distribution.	Yes	Non-coastal utility; therefore storm surge is not an issue.	Yes	The District does not have any foreign attachments on the facilities.	The District performs a visual inspection monthly, and inspects the distribution facilities every eight years.	All distribution poles were inspected and treated by an outside contractor in 2013. The District has 19 wooden distribution poles. No inspections were completed in 2017.	All distribution poles passed inspection.	The District's transmission system has no wooden poles in service. The transmission system includes approximately 14 miles of overhead transmission ROW. The distribution system is essentially an underground system with 19 wooden poles.	14 miles of transmission rights of way is ridden monthly for visual inspection. The District contracts tree trimming each spring to clear any issues on rights of way.	Periodic inspections in 2017 yielded minimal instances of vegetation encroachment. In each scenario, tree-trimming services were engaged to remove any concerns. The District continues its long-term vegetation management plan to ensure all clearances remain within acceptable tolerances.

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Starke, City of	Yes	Yes. The City participates in the PURC granular wind research study through the Florida Municipal Electric Association.	Non-coastal utility; therefore storm surge is not an issue.	Yes	The City is in the process of studying this issue.	The City is in process of having all their poles GIS mapped. To date, they have approximately one-third of their poles mapped and inspected. The poles are replaced as needed on a visual basis.	One third of the City's poles (1,255) poles were inspected.	In 2017, eleven poles (0.87%) were found to be rotten or there was a vehicle accident.	The City has no transmission poles. The following distribution poles were replaced in 2017: One (0.026%), Class 2, 30 foot, One (0.79%) Class 2, 35 foot, six (0.159%) Class 2, 40 foot, one (0.026%) Class 2, 45 foot and two (0.53%) Class2, 50 foot.	The City trims their trees upon visual inspection. The City trims 33% of their electrical distribution system annually.	The City trims distribution lines throughout the year as needed and when applicable removes dead or decayed trees. The City trimmed 33% of distribution system in 2017. The City will use the information from PURC's VM workshops to improve their VM.

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	Guided by Extreme Wind Loading per Figure 250-2(d)										
Utility	Major Planned Work Expansion, Rebuild or Relocation	Targeted Critical Infrastructures and major thoroughfares	Effects of flooding & storm surges on UG and OH distribution facilities	Placement of distribution facilities to facilitate safe and efficient access	Written safety, pole reliability, pole loading capacity and engineering standards for attachments	Description of policies, guidelines, practices, procedures, cycles, and pole selection	Number and percent of poles and structures planned and completed	Number and percent of poles and structures failing inspections with reasons	Number and percent of poles and structures by class replaced or remediated with description	Description of policies, guidelines, practices, procedures, tree removals, with sufficient explanation	Quantity, level, and scope of planned and completed for transmission and distribution
Tallahassee, City of	Yes	Yes	Non-coastal utility; therefore storm surge is not an issue. However, the City's Electric Purdom Generation Station in St. Marks is subject to storm surge and flooding. There is a plan in place to address flooding and storm surge that is reviewed annually.	Yes	Yes	Every 8 years a new pole inspection cycle is initiated to inspect all poles over a 3-year period. The inspection includes visual inspection, sound & bore, internal & fumigant treatment, assessment & evaluation for strength standards. The City performs a climbing and physical inspection of its transmission structures on a 5-year cycle.	598 (19%) transmission poles were inspected in 2017. All distribution poles were inspected from FY 2013-FY 2014. No distribution pole inspections were performed in 2017. The next cycle will begin in 2021.	The annual climbing inspection identified 8 (0.2%) transmission poles/structures to be rejected due to wood decay or other deteriorating conditions.	8 (0.2%) transmission poles were replaced with poles ranging from 60 feet to 85 feet, Classes 2-3. The City replaced 146 (0.263%) distribution poles and structures in 2017. The poles ranged from 30 feet to 60 feet, Classes 1 to 5.	The transmission facilities are on a 3-year trim cycle with target of 25 to 32 feet clearance on lines. The distribution facilities are on an 18-month trim cycle on overhead lines to 6 feet clearances.	The transmission rights of way & easements were mowed in 2017. Approximately 1,037 miles of overhead distribution lines were managed in 2016 and 2017.

Appendix B. Summary of Municipal Electric Utility Reports Pursuant to Rule 25-6.0343, F.A.C. – Calendar Year 2017

	The extent to which Standards of construction address:					Transmission & Distribution Facility Inspections				Vegetation Management Plan (VMP)	
	Guided by Extreme Wind Loading per Figure 250-2(d)										
Utility	Major Planned Work Expansion, Rebuild or Relocation	Targeted Critical Infrastructures and major thoroughfares	Effects of flooding & storm surges on UG and OH distribution facilities	Placement of distribution facilities to facilitate safe and efficient access	Written safety, pole reliability, pole loading capacity and engineering standards for attachments	Description of policies, guidelines, practices, procedures, cycles, and pole selection	Number and percent of poles and structures planned and completed	Number and percent of poles and structures failing inspections with reasons	Number and percent of poles and structures by class replaced or remediated with description	Description of policies, guidelines, practices, procedures, tree removals, with sufficient explanation	Quantity, level, and scope of planned and completed for transmission and distribution
Wauchula, City of	Yes	Yes	Non-coastal utility; therefore storm surge is not an issue.	Yes	Yes	The City of Wauchula has a third-party contractor inspect its substation yearly and 40% of distribution poles in 2017-18.	The City of Wauchula has a third-party contractor inspect its substation yearly and 40% of distribution poles in 2017-18.	Approximately 8% (out of 3,200 poles) have failed due to poles rotting.	98 distribution poles were replaced in 2017 ranging from 35 feet to 55 feet, all Class 4.	The policy on vegetation management is on a three-year cycle that includes trimming trees and herbicides for vines.	The City completes one-third of the system every year. The City also uses PURC's 2007 and 2009 vegetation management reports to help improve its practices.

Appendix B. Summary of Municipal Electric Utility Reports Pursuant to Rule 25-6.0343, F.A.C. – Calendar Year 2017

	The extent to which Standards of construction address:					Transmission & Distribution Facility Inspections				Vegetation Management Plan (VMP)	
	Guided by Extreme Wind Loading per Figure 250-2(d)										
Utility	Major Planned Work Expansion, Rebuild or Relocation	Targeted Critical Infrastructures and major thoroughfares	Effects of flooding & storm surges on UG and OH distribution facilities	Placement of distribution facilities to facilitate safe and efficient access	Written safety, pole reliability, pole loading capacity and engineering standards for attachments	Description of policies, guidelines, practices, procedures, cycles, and pole selection	Number and percent of poles and structures planned and completed	Number and percent of poles and structures failing inspections with reasons	Number and percent of poles and structures by class replaced or remediated with description	Description of policies, guidelines, practices, procedures, tree removals, with sufficient explanation	Quantity, level, and scope of planned and completed for transmission and distribution
Williston, City of	Yes	Yes	Not applicable, the City of Williston is a non-costal utility; therefore storm surge/flooding is not an issue.	Yes	As a result of employee turnover within the management ranks the City has not established any data on pole reliability, pole loading capacity, or engineering standards and procedures for attachments by others to our distribution poles. The City anticipates outsourcing this function in the 2017–2018 budget years.	All distribution poles are visual and sound inspection on a three-year cycle. The city uses both the bore method and the visual and sound method to inspect poles.	33% of 1,100 poles were inspected in 2017. This is the third year of the three-year cycle.	Two (0.55%) poles found defective due to wood decay at or below ground level.	Two poles failing inspection were 45 feet, Class 2, which all have been replaced with the same type of pole.	The distribution lines are on a three-year trim cycle with attention to problem trees during the same cycle. Any problem tree not in rights of way is addressed to the property owner to correct.	One-third of distribution facilities are trimmed every year to obtain a three-year cycle.

Appendix B. Summary of Municipal Electric Utility Reports Pursuant to Rule 25-6.0343, F.A.C. – Calendar Year 2017

	The extent to which Standards of construction address:					Transmission & Distribution Facility Inspections				Vegetation Management Plan (VMP)	
	Guided by Extreme Wind Loading per Figure 250-2(d)										
Utility	Major Planned Work Expansion, Rebuild or Relocation	Targeted Critical Infrastructures and major thoroughfares	Effects of flooding & storm surges on UG and OH distribution facilities	Placement of distribution facilities to facilitate safe and efficient access	Written safety, pole reliability, pole loading capacity and engineering standards for attachments	Description of policies, guidelines, practices, procedures, cycles, and pole selection	Number and percent of poles and structures planned and completed	Number and percent of poles and structures failing inspections with reasons	Number and percent of poles and structures by class replaced or remediated with description	Description of policies, guidelines, practices, procedures, tree removals, with sufficient explanation	Quantity, level, and scope of planned and completed for transmission and distribution
Winter Park, City of	The City has an initiative to put its entire distribution system underground The City requires new residential service to be installed underground and to date, 65.5% of the system is underground.	The facilities are not designed to meet extreme loading standards on a system wide basis. The City participates in PURC's granular wind research study through Florida Municipal Electric Association.	Non-coastal utility; therefore storm surge is not an issue	Yes	Yes	The City does not own transmission poles or lines. The distribution facilities are on an eight-year cycle, which the City is evaluating the cycle for length. The inspection includes visual, assessment prior to climbing and sounding with a hammer.	The City does not own transmission poles. The City did not conduct pole inspections in 2017; however, WPE routinely inspect poles that are involved with daily jobs and work orders.	The City replaced one pole in 2017. The cause was damaged during a seasonal storm.	Based on the 2007 full system inspections, all repairs and replacements have been made. The City routinely inspects the poles involved with daily jobs and work orders. The pole replaced was a 30 foot Class 1 wood pole. This pole was replaced with a 30 foot concrete light pole.	Vegetation Management is performed by an outside contractor on a three-year trim cycle, which is augmented as needed between cycles.	The trimming crews trimmed approximately 45.0 miles of distribution lines in 2017. The City is using the PURC 2007 and 2009 reports to improve VMP practices.

Appendix C. Summary of Rural Electric Cooperative Utility Reports Pursuant to Rule 25-6.0343, F.A.C. – Calendar Year 2017

Utility	The extent to which Standards of construction address:					Transmission & Distribution Facility Inspections				Vegetation Management Plan (VMP)	
	Guided by Extreme Wind Loading per Figure 250-2(d)		Effects of flooding & storm surges on UG and OH distribution facilities	Placement of distribution facilities to facilitate safe and efficient access	Written safety, pole reliability, pole loading capacity and engineering standards for attachments	Description of policies, guidelines, practices, procedures, cycles, and pole selection	Number and percent of poles and structures planned and completed	Number and percent of poles and structures failing inspections with reasons	Number and percent of poles and structures by class replaced or remediated with description	Description of policies, guidelines, practices, procedures, tree removals, with sufficient explanation	Quantity, level, and scope of planned and completed for transmission and distribution
	Major Planned Work Expansion, Rebuild or Relocation	Targeted Critical Infrastructures and major thoroughfares									
Central Florida Electric Cooperative, Inc.	Yes	Central Florida's facilities are not designed to be guided by the extreme loading standards on a system wide basis. However, the wind standard for central Florida's facilities is between 100 mph inland and 130 mph at the coast.	Central Florida continues to participation in evaluation of PURC study to determine effectiveness of relocating to underground.	Yes	Yes	100% of the transmission facilities are inspected annually using above and ground level inspections. The distribution facilities are on a nine-year cycle for inspections using above and ground level inspections.	Central Florida planned and inspected 43 miles of the transmission facilities in 2017. 14,150 (16%) distribution poles were inspected in 2017.	Of the 14,150 distribution poles inspected in 2017, 530 (3.75%) were rejected. These poles are scheduled to be replaced.	453 distribution poles were replaced in 2017. The poles varied from 30 feet to 50 feet, Class 2 to Class 6.	Trees are trimmed or removed within 15 feet of main lines, taps, and guys on a five-year plan.	In 2017, 611 miles of 3,141 miles of primary overhead line on the system were cleared.

Appendix C. Summary of Rural Electric Cooperative Utility Reports Pursuant to Rule 25-6.0343, F.A.C. – Calendar Year 2017

Utility	The extent to which Standards of construction address:					Transmission & Distribution Facility Inspections				Vegetation Management Plan (VMP)	
	Guided by Extreme Wind Loading per Figure 250-2(d)		Effects of flooding & storm surges on UG and OH distribution facilities	Placement of distribution facilities to facilitate safe and efficient access	Written safety, pole reliability, pole loading capacity and engineering standards for attachments	Description of policies, guidelines, practices, procedures, cycles, and pole selection	Number and percent of poles and structures planned and completed	Number and percent of poles and structures failing inspections with reasons	Number and percent of poles and structures by class replaced or remediated with description	Description of policies, guidelines, practices, procedures, tree removals, with sufficient explanation	Quantity, level, and scope of planned and completed for transmission and distribution
	Major Planned Work Expansion, Rebuild or Relocation	Targeted Critical Infrastructures and major thoroughfares									
Choctawhatchee Electric Cooperative, Inc.	Yes	Yes	Yes	Yes	Yes. Inspect and physically count every attachment on a three-year cycle.	The Coop inspects new construction of power lines on a monthly basis and has an eight-year cycle to cover all poles.	During 2017, 7,783 poles or 13% of 59,824 total poles were inspected.	682 poles or 8.8% of the poles failed inspection ranging from spit top to wood rot.	47.6% of 682 failed poles were replaced.	Current rights of way program is to cut, mow, or otherwise manage 20% of its rights of way on an annual basis. Standard cutting is 10 feet on either side of primary from ground to sky. In 2015, the Coop increased the standard overhead primary line easement area from 20 feet to 30 feet.	In 2017, 500 miles were cut on primary lines and the Coop worked to remove problem tress under the primary lines, which reduces hot-spotting requirements between cycles. The Company also established herbicidal spraying program.

Appendix C. Summary of Rural Electric Cooperative Utility Reports Pursuant to Rule 25-6.0343, F.A.C. – Calendar Year 2017

Utility	The extent to which Standards of construction address:					Transmission & Distribution Facility Inspections				Vegetation Management Plan (VMP)	
	Guided by Extreme Wind Loading per Figure 250-2(d)		Effects of flooding & storm surges on UG and OH distribution facilities	Placement of distribution facilities to facilitate safe and efficient access	Written safety, pole reliability, pole loading capacity and engineering standards for attachments	Description of policies, guidelines, practices, procedures, cycles, and pole selection	Number and percent of poles and structures planned and completed	Number and percent of poles and structures failing inspections with reasons	Number and percent of poles and structures by class replaced or remediated with description	Description of policies, guidelines, practices, procedures, tree removals, with sufficient explanation	Quantity, level, and scope of planned and completed for transmission and distribution
	Major Planned Work Expansion, Rebuild or Relocation	Targeted Critical Infrastructures and major thoroughfares									
Clay Electric Cooperative, Inc.	Yes	Clay's distribution facilities are not designed to be guided by the extreme wind loading standards specified by Figure 250-2(d) except as required by rule 250-C, but Clay's transmission facilities are guided by the extreme wind loading. Clay is participating in the PURC's granular wind research study through the Florida Municipal Electric Association.	Non-coastal utility; therefore storm surge is not an issue.	Yes	Yes	Clay's transmission facilities are on a ten-year cycle, which includes sound/bore techniques, excavation, climbing inspection (four-year cycle), and ground (two-year) patrol. Clay's distribution system is now on a ten-year cycle using excavation, sound and bore at the ground line and visual inspection (five-year cycle) and system feeder inspection excluding ground line (five-year cycle).	Clay completed the transmission ground patrol inspection in 2016 & the next inspection will be done in 2026. Clay performed a climbing inspection in 2016. In 2017, 42,313 distribution poles were inspected.	The inspection found 6 (0.2%) transmission poles inspected required some form of maintenance and 9 (0.3%) poles resulted in rejects. 18,154 (43%) distribution poles were rejected due to ground rot, top decay, holes high, split, rot, and storm damage.	6 (0.2%) transmission poles required maintenance. 9 (0.3%) transmission poles were replaced with 55 to 75 feet, Class 1 poles. 1699 distribution poles were replaced with poles ranging from 20 feet to 60 feet, Class 2 to 7.	Clay's VMP for the transmission facilities is on a three-year cycle and includes mowing, herbicide spraying and systematic re-cutting. Clay's VMP for the distribution facilities is on a three-year cycle for city, a four-year cycle for urban and five-year cycle for rural and includes mowing spraying and re-cutting.	In 2017, Clay mowed 54.14 miles, sprayed 54.85 miles, and recut 47.64 miles of its transmission rights of way. In 2017, Clay mowed 2,399.38 miles, sprayed 2,361.03 miles, and recut 2,011.8 miles of its distribution circuits.

Appendix C. Summary of Rural Electric Cooperative Utility Reports Pursuant to Rule 25-6.0343, F.A.C. – Calendar Year 2017

	The extent to which Standards of construction address:					Transmission & Distribution Facility Inspections				Vegetation Management Plan (VMP)	
	Guided by Extreme Wind Loading per Figure 250-2(d)										
Utility	Major Planned Work Expansion, Rebuild or Relocation	Targeted Critical Infrastructures and major thoroughfares	Effects of flooding & storm surges on UG and OH distribution facilities	Placement of distribution facilities to facilitate safe and efficient access	Written safety, pole reliability, pole loading capacity and engineering standards for attachments	Description of policies, guidelines, practices, procedures, cycles, and pole selection	Number and percent of poles and structures planned and completed	Number and percent of poles and structures failing inspections with reasons	Number and percent of poles and structures by class replaced or remediated with description	Description of policies, guidelines, practices, procedures, tree removals, with sufficient explanation	Quantity, level, and scope of planned and completed for transmission and distribution
Escambia River Electric Cooperative	Yes	Yes	Non-coastal utility; therefore storm surge is not an issue.	Yes	Yes	Escambia River inspects its distribution facilities on an eight-year cycle using visual, sound, and bore techniques in accordance with RUS standards.	4,800 (14%) distribution poles were planned and 4,854 (14%) inspections were completed in 2017. Escambia River does not own any transmission poles.	Approximately 530 poles failed inspection in 2017. The common cause was pole rot.	In 2017, Escambia River replaced 176 poles and retired 17 poles.	Escambia River's distribution facilities are on a five-year trim cycle. Distribution lines and rights of way is cleared 20 feet; 10 feet on each side.	In 2017, approximately 300 miles (19.3%) of the power lines were trimmed with 310 miles (20%) planned.

Appendix C. Summary of Rural Electric Cooperative Utility Reports Pursuant to Rule 25-6.0343, F.A.C. – Calendar Year 2017

Utility	The extent to which Standards of construction address:					Transmission & Distribution Facility Inspections				Vegetation Management Plan (VMP)	
	Guided by Extreme Wind Loading per Figure 250-2(d)		Effects of flooding & storm surges on UG and OH distribution facilities	Placement of distribution facilities to facilitate safe and efficient access	Written safety, pole reliability, pole loading capacity and engineering standards for attachments	Description of policies, guidelines, practices, procedures, cycles, and pole selection	Number and percent of poles and structures planned and completed	Number and percent of poles and structures failing inspections with reasons	Number and percent of poles and structures by class replaced or remediated with description	Description of policies, guidelines, practices, procedures, tree removals, with sufficient explanation	Quantity, level, and scope of planned and completed for transmission and distribution
	Major Planned Work Expansion, Rebuild or Relocation	Targeted Critical Infrastructures and major thoroughfares									
Florida Keys Electric Cooperative Association, Inc.	Yes	The facilities were not designed to the extreme loading standards on a system wide basis. However, the Company has adopted the extreme wind loading standard in April 2007.	Yes	Yes	Yes	The company inspects 100% of the transmission structures annually by helicopter. The distribution poles are on a four-year cycle. The four-year cycle was completed in 2010. All 10,698 distribution poles have been inspected and all 1,003 rejects have been replaced. Inspections and treatment resumed in 2015.	100% of the transmission poles were inspected in 2017 by helicopter. 32 structures in the water alongside Long Key bridge were inspected above and below the water line in 2016. The remaining 88 water structures were inspected in 2017. 3,520 (25%) distribution poles were inspected in 2017.	The 32 structures alongside Long Key bridge will have repairs to the foundations to extend the life of the structure. This work will take place in 2017/2018. The remaining 88 transmission structures will also have foundation repairs beginning late 2018 or 2019. 84 (2.3%) distribution poles failed inspection in 2017.	No transmission poles were replaced in 2017. 84 distribution poles were replaced in 2017.	100% of the transmission system is inspected and trimmed annually. The distribution system is on a three-year trimming cycle. The trade-a-tree program was implemented in 2007 for problem trees within the rights of way.	Annual transmission line rights of way clearing from mile marker 106 to County Road 905 to the Dade/Monroe County line was completed in 2017. The remainder of the transmission system was spot trimmed. All substations were trimmed prior to April 1, 2017. Approximately 120 circuit miles of distribution lines were trimmed in 2017. Additional distribution spot trimming was conducted as necessary.

Appendix C. Summary of Rural Electric Cooperative Utility Reports Pursuant to Rule 25-6.0343, F.A.C. – Calendar Year 2017

	The extent to which Standards of construction address:					Transmission & Distribution Facility Inspections				Vegetation Management Plan (VMP)	
	Guided by Extreme Wind Loading per Figure 250-2(d)										
Utility	Major Planned Work Expansion, Rebuild or Relocation	Targeted Critical Infrastructures and major thoroughfares	Effects of flooding & storm surges on UG and OH distribution facilities	Placement of distribution facilities to facilitate safe and efficient access	Written safety, pole reliability, pole loading capacity and engineering standards for attachments	Description of policies, guidelines, practices, procedures, cycles, and pole selection	Number and percent of poles and structures planned and completed	Number and percent of poles and structures failing inspections with reasons	Number and percent of poles and structures by class replaced or remediated with description	Description of policies, guidelines, practices, procedures, tree removals, with sufficient explanation	Quantity, level, and scope of planned and completed for transmission and distribution
Glades Electric Cooperative, Inc.	Yes	Yes	Non-coastal utility; therefore storm surge is not an issue; GEC participated in a workshop hosted by Florida Catastrophic Planning that addressed flooding and storm surges.	Yes	Yes	The facilities are on a 10-year sound and bore inspection cycle with excavation inspection cycle for all wood poles in addition to System Improvement Plan inspections.	100% of total 83 miles of transmission lines were planned and completed by visual inspections. 2,502 miles of distribution lines and 125 miles of underground distribution lines were planned and inspected in 2017. 5,050 poles were also inspected in 2017.	421 (8%) distribution poles failed due to decay, rot and top splits. The Cooperative also replaced an additional 830 poles after Hurricane Irma.	All 421 distribution poles rejected in the 2017 inspection was replaced. The distribution poles ranged from 35 to 40 foot, Class 5 to 6 and were replaced with 35 to 40 foot, Class 3 or Class 5 poles.	All trimming is on a three-year cycle. The rights of way are trimmed for 10-foot clearance on both sides, and herbicide treatment is used where needed.	GEC trimmed 526 miles of distribution circuits in 2016. The transmission rights of way are inspected annually and trimmed if necessary. Vegetation growth is not an issue for the transmission lines.

Appendix C. Summary of Rural Electric Cooperative Utility Reports Pursuant to Rule 25-6.0343, F.A.C. – Calendar Year 2017

	The extent to which Standards of construction address:					Transmission & Distribution Facility Inspections				Vegetation Management Plan (VMP)	
	Guided by Extreme Wind Loading per Figure 250-2(d)										
Utility	Major Planned Work Expansion, Rebuild or Relocation	Targeted Critical Infrastructures and major thoroughfares	Effects of flooding & storm surges on UG and OH distribution facilities	Placement of distribution facilities to facilitate safe and efficient access	Written safety, pole reliability, pole loading capacity and engineering standards for attachments	Description of policies, guidelines, practices, procedures, cycles, and pole selection	Number and percent of poles and structures planned and completed	Number and percent of poles and structures failing inspections with reasons	Number and percent of poles and structures by class replaced or remediated with description	Description of policies, guidelines, practices, procedures, tree removals, with sufficient explanation	Quantity, level, and scope of planned and completed for transmission and distribution
Gulf Coast Electric Cooperative, Inc.	Not bound by the extreme loading standards due to system is 99.9% under the 60 foot extreme wind load requirements.	The method of construction used by GCEC does, however, meet the "design to withstand, without conductors, extreme wind loading in Rule 250C applied in any direction on the structure."	Yes. GCEC continues to evaluate the PURC study to determine effectiveness of relocating to underground	Yes	Yes	No transmission lines. Performs general distribution pole inspections on an eight-year cycle. Also, GECE inspects underground transformers and other padmount equipment on a four-year cycle.	GCEC inspected 7,852 (16.1%) distribution poles, in 2017. Also, in 2017, GCEC inspected 270 padmount transformers, 193 pull box cabinets, 91 secondary pedestals, and 5 switchgears, which accounts for approximately 29.7% of padmounted equipment.	Of the 7,852 poles inspected in 2017, 104 (1.3%) poles were rejected. The poles were rejected due to decay pockets (3, 2.9%), decay/split tops (12, 11.5%), ground rot (85, 81.7%), mechanical damage (2, 1.9%), and woodpecker holes (2, 1.9%)	In 2017, GCEC replaced 81 wooden poles.	GCEC owns approximately 2,158 miles of overhead and 435 miles of underground distribution lines. GCEC strives to clear the entire ROW on a five-year cycle. GCEC clears between 20 and 30 foot width, from ground to sky.	GCEC trimmed approximately 400 miles of ROW in 2016 and 2017. GCEC also works closely with property owners for danger tree removal.

Appendix C. Summary of Rural Electric Cooperative Utility Reports Pursuant to Rule 25-6.0343, F.A.C. – Calendar Year 2017

	The extent to which Standards of construction address:					Transmission & Distribution Facility Inspections				Vegetation Management Plan (VMP)	
	Guided by Extreme Wind Loading per Figure 250-2(d)										
Utility	Major Planned Work Expansion, Rebuild or Relocation	Targeted Critical Infrastructures and major thoroughfares	Effects of flooding & storm surges on UG and OH distribution facilities	Placement of distribution facilities to facilitate safe and efficient access	Written safety, pole reliability, pole loading capacity and engineering standards for attachments	Description of policies, guidelines, practices, procedures, cycles, and pole selection	Number and percent of poles and structures planned and completed	Number and percent of poles and structures failing inspections with reasons	Number and percent of poles and structures by class replaced or remediated with description	Description of policies, guidelines, practices, procedures, tree removals, with sufficient explanation	Quantity, level, and scope of planned and completed for transmission and distribution
Lee County Electric Cooperative, Inc.	Yes	Yes	Yes. The majority of LCEC's underground facilities, excluding conduits and cables, are at or above existing/surrounding grade.	Yes	Yes	Transmission facilities are inspected ever two years for 138 kV systems. The inspections are done by climbing or the use of a bucket truck. The distribution facilities are on a two-year visual inspection cycle and on a 10-year climbing inspection cycle for splitting, cracking, decay, twisting, and bird damage.	In 2017, 1,160 (50%) transmission poles were inspected, which was 100% of the poles that were scheduled. 62,520 (38.9%) distribution poles were inspected, which was 100.0% of the inspections scheduled.	39 (3.4%) transmission poles failed inspection due to rot and life expectancy. 1,134 (1.6%) distribution poles failed inspection due to rot/split top, out of plumb, and woodpecker damage.	38 transmission poles were replaced with concrete and steel poles. 29 (2.5%) distribution poles were repaired through trussing and patching. 1,651 poles were replaced in 2017. The sizes varied by Class 1 to Class 6.	VMP strategies include cultural, mechanical, manual, & chemical treatments and the plan is on a six-year cycle for 1-phase distribution facilities and three years for 2 & 3 phase distribution facilities. The 138 kV transmission systems are on an annual cycle.	LCEC completed 36.77 miles (100%) of Transmission trimming, 395 miles (100%) three-phase trimming, and 351 (100%) miles of single-phase trimming,

Appendix C. Summary of Rural Electric Cooperative Utility Reports Pursuant to Rule 25-6.0343, F.A.C. – Calendar Year 2017

	The extent to which Standards of construction address:					Transmission & Distribution Facility Inspections				Vegetation Management Plan (VMP)	
	Guided by Extreme Wind Loading per Figure 250-2(d)										
Utility	**Major Planned Work Expansion, Rebuild or Relocation**	**Targeted Critical Infrastructures and major thoroughfares**	**Effects of flooding & storm surges on UG and OH distribution facilities**	**Placement of distribution facilities to facilitate safe and efficient access**	**Written safety, pole reliability, pole loading capacity and engineering standards for attachments**	**Description of policies, guidelines, practices, procedures, cycles, and pole selection**	**Number and percent of poles and structures planned and completed**	**Number and percent of poles and structures failing inspections with reasons**	**Number and percent of poles and structures by class replaced or remediated with description**	**Description of policies, guidelines, practices, procedures, tree removals, with sufficient explanation**	**Quantity, level, and scope of planned and completed for transmission and distribution**
Okefenoke Rural Electric Membership Cooperative	Yes	The facilities are not designed to be guided by the extreme loading standards on a system wide basis. OREMC is participating in PURC's granular wind research study.	OREMC is continuing the evaluation of the PURC study to determine effectiveness of relocating to underground.	Yes	Yes	OREMC owns no transmission facilities. The inspections for the distribution systems include visual, sound/bore with excavations, and chemical treatment.	In 2017, OREMC performed inspections on 7,644 (13.1%) poles. OREMC has 58,146 wood poles as of December 31, 2017.	In 2017, 64 (0.84%) poles were rejected. The cause of the rejection was ground rot and above ground damage.	The 32 poles failing inspection in 2017 are scheduled to be replaced in 2018. During the course of other projects, 976 new poles were added and 700 poles were retired in 2017.	Vegetation control practices consist of complete clearing to the ground line, trimming, and herbicides. The VMP is on a five-year trim cycle. OREMC utilizes contractors for its VM programs.	OREMC planned 500 miles of rights of way for trimming and completed 588 miles in 2017. Also in 2017, contractors sprayed 728 miles of rights of way.

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	The extent to which Standards of construction address:					Transmission & Distribution Facility Inspections				Vegetation Management Plan (VMP)	
	Guided by Extreme Wind Loading per Figure 250-2(d)										
Utility	Major Planned Work Expansion, Rebuild or Relocation	Targeted Critical Infrastructures and major thoroughfares	Effects of flooding & storm surges on UG and OH distribution facilities	Placement of distribution facilities to facilitate safe and efficient access	Written safety, pole reliability, pole loading capacity and engineering standards for attachments	Description of policies, guidelines, practices, procedures, cycles, and pole selection	Number and percent of poles and structures planned and completed	Number and percent of poles and structures failing inspections with reasons	Number and percent of poles and structures by class replaced or remediated with description	Description of policies, guidelines, practices, procedures, tree removals, with sufficient explanation	Quantity, level, and scope of planned and completed for transmission and distribution
Peace River Electric Cooperative, Inc.	Yes	The facilities are not designed to be guided by the extreme loading standards on a system wide basis. Peace River is currently participating in PURC granular wind research study.	Peace River is continuing the evaluation of PURC study to determine effectiveness of relocating to underground to prevent storm damage and outages.	Yes	Yes	Peace River currently uses RDUP bulletin 1730B-121 for planned inspection and maintenance. The facilities are located in Decay Zone 5 and are inspected on an eight-year cycle. The transmission poles are visually inspected every two years.	391 transmission (170 concrete, 3 steel, 218 wooden) poles are inspected every two years. 3,248 (5.7%) of 56,835 distribution poles were inspected.	Peace River did not replace any transmission poles in 2017. 337 (10%) distribution poles were rejected in 2017.	Peace River replaced 331 poles in 2017. The distribution poles receiving remediation in 2017 varied from 25 foot to 55 foot, Class 3 to 7.	Peace River utilized guidelines in either RUS bulletins or other materials available through RUS. In addition, Peace River uses a Georgia Rights of Way program, which uses a ground to sky method by removing trees. The VMP is on a four- to five-year cycle.	In 2017, the Company completed rights of way maintenance on 432 (15.47%) of its 2,804 miles of overhead distribution.

Appendix C. Summary of Rural Electric Cooperative Utility Reports Pursuant to Rule 25-6.0343, F.A.C. – Calendar Year 2017

Utility	The extent to which Standards of construction address:					Transmission & Distribution Facility Inspections				Vegetation Management Plan (VMP)	
	Guided by Extreme Wind Loading per Figure 250-2(d)		Effects of flooding & storm surges on UG and OH distribution facilities	Placement of distribution facilities to facilitate safe and efficient access	Written safety, pole reliability, pole loading capacity and engineering standards for attachments	Description of policies, guidelines, practices, procedures, cycles, and pole selection	Number and percent of poles and structures planned and completed	Number and percent of poles and structures failing inspections with reasons	Number and percent of poles and structures by class replaced or remediated with description	Description of policies, guidelines, practices, procedures, tree removals, with sufficient explanation	Quantity, level, and scope of planned and completed for transmission and distribution
	Major Planned Work Expansion, Rebuild or Relocation	Targeted Critical Infrastructures and major thoroughfares									
Sumter Electric Cooperative, Inc.	Yes	Transmission and distribution facilities are designed to withstand winds of 110 MPH in accordance with 2012 NESC extreme wind load	Non-coastal utility; therefore storm surge is not an issue	Yes	Yes	The transmission facilities are on a five-year cycle using ground line visual inspections, which includes sounding and boring and excavation. The distribution facilities are on an eight-year cycle using sound, bore, & excavation tests.	19 (1.7%) transmission poles were planned and 19 (100%) were inspected in 2017. 18,720 (13.6%) distribution poles were planned and 18,720 (100%) were inspected in 2017. 7,362 (12.2%) distribution underground structures were planned and 7,362 (100%) were inspected in 2017.	Zero transmission poles failed inspection. 3,007 (16%) distribution poles failed inspection. The causes are due to ground rot and top deterioration.	19 (100%) wooden transmission poles were replaced with spun-concrete poles. 3,006 distribution poles were replaced (99.97%). The transmission and distribution poles ranged from 25 to 85 foot and Class 1 to Class 7.	Distribution and transmission systems are on a three-year trim cycle for feeder and laterals. In 2017, due to budgetary constraints, the scheduled miles for trimming were reduced from 1,500 to 1,211, then again to 925 miles due to the impact of Hurricane Irma. In 2017, Sumter trimmed 974.5 circuit miles, applied herbicide to 351 miles and removed 20,784 trees.	Sumter plans to meet current tree trim cycles, tree removals, and herbicide treatment. An estimated 1,500 miles of underbrush treatment is being scheduled for 2018.

Appendix C. Summary of Rural Electric Cooperative Utility Reports Pursuant to Rule 25-6.0343, F.A.C. – Calendar Year 2017

	The extent to which Standards of construction address:					Transmission & Distribution Facility Inspections				Vegetation Management Plan (VMP)	
	Guided by Extreme Wind Loading per Figure 250-2(d)										
Utility	Major Planned Work Expansion, Rebuild or Relocation	Targeted Critical Infrastructures and major thoroughfares	Effects of flooding & storm surges on UG and OH distribution facilities	Placement of distribution facilities to facilitate safe and efficient access	Written safety, pole reliability, pole loading capacity and engineering standards for attachments	Description of policies, guidelines, practices, procedures, cycles, and pole selection	Number and percent of poles and structures planned and completed	Number and percent of poles and structures failing inspections with reasons	Number and percent of poles and structures by class replaced or remediated with description	Description of policies, guidelines, practices, procedures, tree removals, with sufficient explanation	Quantity, level, and scope of planned and completed for transmission and distribution
Suwannee Valley Electric Cooperative, Inc.	Yes	SVEC facilities are not designed to be guided by the extreme loading standards on a system wide basis. SVEC participates in PURC wind study.	Non-coastal utility; therefore storm surge is not an issue	Yes	Yes	SVEC inspects all structures on an eight-year cycle using sound/bore and visual inspection procedures.	SVEC inspected five (100%) transmission structures in 2017. 10,343 (12%) distribution structures were inspected in 2017.	1,114 (11%) inspections of distribution poles failed due to ground line decay, excessive splitting, & woodpecker damage. Zero inspections of transmission poles failed.	851 (8%) distribution poles of total inspected were remediated by ground line treatment and 721 (7%) distribution poles were replaced. Zero transmission structures were remediated.	SVEC's facilities are on a four- to three-year inspection cycle includes cutting, spraying and visual on as-needed basis.	In 2017, 1,074 (29%) miles were cut and 967 miles rights of way sprayed. 950 (28%) miles are planned for cutting and 1,044 miles are planned for spraying in 2018.

Appendix C. Summary of Rural Electric Cooperative Utility Reports Pursuant to Rule 25-6.0343, F.A.C. – Calendar Year 2017

Utility	The extent to which Standards of construction address:					Transmission & Distribution Facility Inspections				Vegetation Management Plan (VMP)	
	Guided by Extreme Wind Loading per Figure 250-2(d)		Effects of flooding & storm surges on UG and OH distribution facilities	Placement of distribution facilities to facilitate safe and efficient access	Written safety, pole reliability, pole loading capacity and engineering standards for attachments	Description of policies, guidelines, practices, procedures, cycles, and pole selection	Number and percent of poles and structures planned and completed	Number and percent of poles and structures failing inspections with reasons	Number and percent of poles and structures by class replaced or remediated with description	Description of policies, guidelines, practices, procedures, tree removals, with sufficient explanation	Quantity, level, and scope of planned and completed for transmission and distribution
	Major Planned Work Expansion, Rebuild or Relocation	Targeted Critical Infrastructures and major thoroughfares									
Talquin Electric Cooperative, Inc.	Yes	Yes	Talquin has a very small percentage subject to storm surge. Stronger anchoring systems are in place to better secure pad-mount transformers and installation of grounding sleeves to secure underground cabinets.	Yes	Yes, inspecting on a five-year cycle.	Annual inspections in house of transmission lines are performed by checking the pole, hardware, and conductors. An outside pole-treating contractor inspects distribution and transmission poles each year. The poles are inspected on eight year rotation since 2007.	8,982 distribution poles were inspected in 2017. There were no transmission poles scheduled for inspection in 2018.	168 (1.9%) of the distribution poles inspected were rejected.	The priority poles were replaced and the rejected poles are being inspected and repaired or replaced if necessary. Talquin replaces 30-foot Class 7 poles with stronger 35-foot Class 6 poles with guys and 35-foot Class 6 poles with 40 foot Class 4 poles as a minimum standard.	Talquin maintains its rights of way by mechanical cutting, mowing, and herbicidal applications.	439 (16%) miles of distribution and 2.76 (5.2%) miles of transmission rights of way were treated in 2017. In addition, Talquin received 1,100 non-routine requests for tree maintenance.

Appendix C. Summary of Rural Electric Cooperative Utility Reports Pursuant to Rule 25-6.0343, F.A.C. – Calendar Year 2017

Utility	The extent to which Standards of construction address:					Transmission & Distribution Facility Inspections				Vegetation Management Plan (VMP)	
	Guided by Extreme Wind Loading per Figure 250-2(d)		Effects of flooding & storm surges on UG and OH distribution facilities	Placement of distribution facilities to facilitate safe and efficient access	Written safety, pole reliability, pole loading capacity and engineering standards for attachments	Description of policies, guidelines, practices, procedures, cycles, and pole selection	Number and percent of poles and structures planned and completed	Number and percent of poles and structures failing inspections with reasons	Number and percent of poles and structures by class replaced or remediated with description	Description of policies, guidelines, practices, procedures, tree removals, with sufficient explanation	Quantity, level, and scope of planned and completed for transmission and distribution
	Major Planned Work Expansion, Rebuild or Relocation	Targeted Critical Infrastructures and major thoroughfares									
Tri-County Electric Cooperative, Inc.	Yes	Yes	The current standard practice is to restrict electrification of flood prone areas. Due to natural landscape within area, storm surge issues are low.	Yes	Yes	The transmission facilities are inspected on a five-year cycle by both ground line and visual inspections. The distribution facilities are on an eight-year cycle using both ground line and visual inspections.	During 2017, the transmission poles were visually inspected. Tri-County inspected 6,169 (11%) distribution poles in 2017.	146 (2.4%) distribution poles were rejected. The Coop repaired 78 broken ground wires.	The 146-rejected distribution poles found during the 2017 inspection, which required replacement, are in the process of being changed out.	The Coop attempts to acquire 30-foot rights of way easement for new construction. The entire width of the obtained ROW easement is cleared from ground level to a maximum height of 60 feet in order to minimize vegetation and ROW interference with the facilities.	In 2017, approximately 600 distribution miles were trimmed and sprayed.

Appendix C. Summary of Rural Electric Cooperative Utility Reports Pursuant to Rule 25-6.0343, F.A.C. – Calendar Year 2017

Utility	The extent to which Standards of construction address:					Transmission & Distribution Facility Inspections				Vegetation Management Plan (VMP)	
	Guided by Extreme Wind Loading per Figure 250-2(d)		Effects of flooding & storm surges on UG and OH distribution facilities	Placement of distribution facilities to facilitate safe and efficient access	Written safety, pole reliability, pole loading capacity and engineering standards for attachments	Description of policies, guidelines, practices, procedures, cycles, and pole selection	Number and percent of poles and structures planned and completed	Number and percent of poles and structures failing inspections with reasons	Number and percent of poles and structures by class replaced or remediated with description	Description of policies, guidelines, practices, procedures, tree removals, with sufficient explanation	Quantity, level, and scope of planned and completed for transmission and distribution
	Major Planned Work Expansion, Rebuild or Relocation	Targeted Critical Infrastructures and major thoroughfares									
West Florida Electric Cooperative Association, Inc.	Yes	Yes. In addition, WFEC completed its long-range system study in 2017. The goal of this study was to develop a guide to relate long-range plant requirements to present actions and to develop a systematic schedule for developing major facilities in order to meet anticipated future system requirements.	Non-coastal utility; therefore, storm surge is not an issue. Some areas in territory are subject to flooding. In these areas, line design is modified to compensate for known flooding conditions.	Yes	Yes. General inspections are completed on an eight-year cycle.	West Florida continues to use RUS Bulletin 1730B-121 as its guideline for pole maintenance and inspection.	During 2017, West Florida inspected 10.5% of entire system.	Out of the 10.5% inspected, 8.3% required maintenance or replacement.	During 2017, 1,091 poles were replaced. 5.3 miles of single phase line was converted to 3 Phase to correct loading issues. The Company re-insulated and upgraded approximately 35 miles of distribution lines from 12.5 KV to 25 KV. The Company relocated 5 miles of line to accommodate the upgrade and widening of local roads.	West Florida's VM includes ground to sky side trimming along with mechanical mowing and tree removal.	During 2017, the Company mowed and side trimmed 685 miles of its distribution system. Also, the Company chemically sprayed approximately 698 miles of rights of way. Approximately 685 miles will be sprayed and approximately 784 miles will be trimmed and mowed during 2018.

Appendix C. Summary of Rural Electric Cooperative Utility Reports Pursuant to Rule 25-6.0343, F.A.C. – Calendar Year 2017

Utility	The extent to which Standards of construction address:					Transmission & Distribution Facility Inspections				Vegetation Management Plan (VMP)	
	Guided by Extreme Wind Loading per Figure 250-2(d)		Effects of flooding & storm surges on UG and OH distribution facilities	Placement of distribution facilities to facilitate safe and efficient access	Written safety, pole reliability, pole loading capacity and engineering standards for attachments	Description of policies, guidelines, practices, procedures, cycles, and pole selection	Number and percent of poles and structures planned and completed	Number and percent of poles and structures failing inspections with reasons	Number and percent of poles and structures by class replaced or remediated with description	Description of policies, guidelines, practices, procedures, tree removals, with sufficient explanation	Quantity, level, and scope of planned and completed for transmission and distribution
	Major Planned Work Expansion, Rebuild or Relocation	Targeted Critical Infrastructures and major thoroughfares									
Withlacoochee River Electric Cooperative, Inc.	Yes	The facilities are not designed to be guided by the extreme wind loading standards on a system wide basis. However, most new construction, major planned work and targeted critical infrastructure meets the design criterions that comply with the standards.	Yes	Yes. In 2016, WREC relocated 61.5 miles of overhead primary lines from rear lots to street, changing out hundreds of older poles and facilities; this will continue until older areas are all upgraded.	Yes	WREC inspects the transmission and distribution facilities annually (approximately (3,008 miles for 2017) by line patrol, physical and visual inspections.	68 miles or 100% of transmission facilities were inspected by walking, riding or aerial patrol. 3,008 miles of distribution facilities were inspected annually by line patrol, voltage conversion, rights of way, and Strategic Targeted Action and Repair (S.T.A.R.).	OSMOSE (a contractor for pole inspection and treatment) found 6.2% poles with pole rot and 1.0% poles were rejected in 2003 to 2004. WREC discontinued this type of inspection/ treatment plan and now data is unavailable on the exact failure rates.	3,344 wooden, composite, cement, concrete, steel, ductile iron, aluminum, and fiberglass poles ranging in size from 12 to 90 feet were added; 2,399 poles were retired.	In 2017, WREC contracted with an arborist company to assist with the aggressive VMP that includes problem tree removal, horizontal/vertical clearances and under-brush to ground. WREC maintains over 150 overhead feeder circuits (over 7,100 miles of line) on a trim cycle between four to five years.	All transmission lines are inspected annually. 12.06 miles of rights of way issues were addressed in 2017. In addition, during 2017, WREC addressed 3,811 rights of way service orders ranging from trimming a single account to trimming an entire subdivision or area.