Matthew R. Bernier
ASSOCIATE GENERAL COUNSEL

February 28, 2022

VIA ELECTRONIC FILING

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

Re: *2021 Annual Service Reliability Report; Undocketed*

Dear Mr. Teitzman:

Please find enclosed for electronic filing on behalf of Duke Energy Florida, LLC ("DEF"), its 2021 Annual Service Reliability Report. DEF also provided two (2) hard copies and two (2) CDs of its Annual Service Reliability Report to the Division of Engineering. Due to the implementation of Rule 25-6.030, Florida Administrative Code, the storm-hardening activities were excluded from this year's Reliability Report filing, and that the information will be filed by June 1, 2022, instead.

Thank you for your assistance in this matter. Please feel free to call me at (850) 521-1428 should you have any questions concerning this filing.

Respectfully,

/s/ Matthew R. Bernier

Matthew R. Bernier

MRB/cmw
Enclosures

cc: Tom Ballinger, Director, Division of Engineering

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2021 Year End Customers Served by Region

Zone/Regions	3 Char OP	Op Center	Cust Served	Date
NORTH CENTRAL	APK	APOPKA	106,314	12/31/2021
	DEL	DELAND	87,056	12/31/2021
	JAM	JAMESTOWN	141,873	12/31/2021
	LNG	LONGWOOD	93,151	12/31/2021
			428,394	
NORTH COASTAL	INV	INVERNESS	79,034	12/31/2021
	MON	MONTICELLO	57,422	12/31/2021
	OCA	OCALA	84,238	12/31/2021
	SEV	SEVEN SPRINGS	198,491	12/31/2021
	ZEP	ZEPHYRHILLS	27,557	12/31/2021
			446,742	
SOUTH CENTRAL	BNV	BUENA VISTA	147,935	12/31/2021
	CLR	CLERMONT	40,066	12/31/2021
	HIL	HIGHLANDS	56,354	12/31/2021
	LKW	LAKE WALES	117,656	12/31/2021
	SEO	SE ORLANDO	96,976	12/31/2021
	WGN	WINTER GARDEN	85,928	12/31/2021
			544,915	
SOUTH COASTAL	CLW	CLEARWATER	147,161	12/31/2021
	STP	ST. PETERSBURG	181,297	12/31/2021
	WAL	WALSINGHAM	154,026	12/31/2021
			482,484	
SYSTEM			**1,902,535**	

I. OVERALL RELIABILITY PERFORMANCE – 2021 (Rule 25-6.0455, F.A.C.)

a. Discuss overall performance absent adjustments

In 2021, Duke Energy Florida, LLC ("DEF" or "the Company") experienced 2 different tornados as well as Tropical Storm Elsa, Tropical Storm Fred and Tropical Storm Mindy. Starting prior to storm season in 2021, there was 1 Tornado on February 14th resulting in 0.23 SAIDI minutes. Once storm season began, there was 1 additional Tornado on August 10th resulting in 0.02 SAIDI minutes. From July 5th to July 8th, DEF experienced the impacts of Tropical Storm Elsa which accounted for 2.2 SAIDI minutes. From August 15th to August 17th, DEF experienced the impacts of Tropical Storm Fred which accounted for 2.4 SAIDI minutes. From September 8th to September 9th, DEF experienced the impacts of Tropical Storm Mindy which accounted for 0.6 SAIDI minutes.

Year	2016	2017	2018	2019	2020	2021
Weather Excluded SAIL	266.9	2469.0	105.4	3.2	21.0	5.4

In 2021, DEF was less impacted by weather events that qualified for exclusions, reducing DEF's unadjusted SAIDI by 86% compared to the prior 5-year average. This large reduction is a result of the large SAIDI in 2016, 2017 and 2018 from the extreme weather events that made landfall, which included Hurricanes Hermine, Matthew, Irma and Michael. Though impact from extreme weather was lower in 2021, DEF continues to improve its reliability by concentrating on its Storm Protection Plan, as well as through its maintenance programs, to prepare its system for these types of events.

Year	2016	2017	2018	2019	2020	2021
Reported SAI	370.7	2572.9	226.3	111.3	124.8	95.5

b. Describe the level of detailed reliability data the Company tracks.

The Company tracks detailed reliability information in various databases. This detailed data is recorded per event, which includes affected device, time of day, length of outage, cause of outage, number of customers affected and other pertinent information.

c. Describe Company efforts to increase critical review of detailed reliability data.

In 2021, DEF continued to utilize the IEEE method for internal business goal reporting, due to integrated business practices. DEF uses the IEEE Methodology (2.5 Beta) for calculating the reliability indices. This is also the way DEF measures reliability for incentive goals. DEF will continue tracking PSC indices which are reported at year-end. The IEEE Method is the industry standard for reliability measurement and comparison.

DEF continued the practice of auditing outage data to ensure accuracy and using Outage Management System Reconciliation (OMSR) as a platform which allows outage data to be captured in greater detail.

In 2021, DEF conducted analysis and reviewed reliability data that met certain operational thresholds in order to reduce the number of outages and momentary interruptions. From 2020 to 2021, DEF had a 14% decrease in the number of MAIFIe events.

d. Describe the process used by your company to identify and select the level of detailed reliability data.

Customer feedback, benchmarking with other utilities, input from the FPSC, performance of assets, and trends are all considered when identifying the level of detailed reliability data.

e. Discuss adjustments

i. Generation events – see pages 10
ii. Transmission events – see page 12.
iii. Extreme weather – see page 13.
iv. Distribution events – see page 15.

f. Discuss adjusted performance.

For the 2021 adjusted performance results, please see pages 16-25.

FLORIDA PUBLIC SERVICE COMMISSION
ANNUAL DISTRIBUTION SERVICE RELIABILITY REPORT – ACTUAL

PART I

CAUSES OF OUTAGE EVENTS – ACTUAL **(Absent Adjustments)**

Utility Name: Duke Energy Florida Year: **2021**

Cause (a)	Customer Minutes Of Interruption	Number of Outage Events(N) (b)	Average Duration (L-Bar) (c)	Average Restoration Time (CAIDI) (d)
1. Animals	6,415,770	5,365	80.6	69.5
2. Vegetation	41,284,338	8,223	159.6	111.8
3. Lightning	3,475,118	1,150	152.1	110.0
4. Other Weather	22,671,944	4,340	149.4	108.0
5. Vehicle	12,516,163	465	242.4	96.7
6. Defective Equipment	38,068,873	11,573	146.3	82.9
7. Unknown	2,173,047	694	96.3	51.6
Subtotal	126,605,253	31,810	139.6	94.9
All Other Causes *See Attached	55,011,793	15,656	144.1	64.9
System Totals	181,617,046	47,466	141.1	83.3

PSC/ECR 102 (8/06)
Incorporated by reference in Rule 25-6.0455, F.A.C

CAUSES OF OUTAGE EVENTS – ACTUAL **(Absent Adjustments)**

Utility Name: Duke Energy Florida Year: **2021**

Cause (a)	Customer Minutes Of Interruption	Number of Outage Events(N) (b)	Average Duration (L-Bar) (c)	Average Restoration Time (CAIDI) (d)
U/G Primary Cable	12,929,265	1,089	297.5	103.9
Emergency Shutdown-PGN	10,773,699	2,554	82.9	34.2
Line Maintenance	7,201,033	5,669	130.4	125.6
Human Error-Public	3,000,835	431	159.3	109.0
Substation-Surge Arrester	2,709,174	3	817.8	588.8
Substation-Defective Equipment	1,980,467	16	69.2	63.8
Right-Of-Way	1,904,855	49	63.4	31.8
U/G Secondary/Service	1,683,082	3,738	180.0	219.9
Transmission-Conductor/Static	1,620,610	11	212.0	126.9
Dig-In	1,379,737	223	190.4	59.0
Relay-Equipment Misapplication	1,369,540	8	119.7	112.4
Substation-Transformer Failure	1,295,658	7	250.8	99.4
Transmission-Animal	898,877	7	108.2	90.2
Substation-Animal	824,520	18	43.6	37.4
Overload	663,423	122	138.9	80.3
Human Error-PGN Contractor	655,668	164	105.6	23.2
Foreign Material In Line	614,462	103	98.3	51.2
Miscellaneous	517,800	511	92.3	58.7
Transmission-Insulator Failure	487,578	2	968.7	187.4
Substation-Breaker Failure	454,617	13	109.7	58.5
Relay-Setting Error	424,329	15	25.1	46.9
Human Error-PGN	389,705	487	73.9	22.6
Relay-Reclosing Relay Failure	362,371	8	50.9	40.5
Substation-Lightning	151,018	3	197.2	196.1
Relay-Relay Problem	128,868	3	154.7	78.8
Equipment Misapplication	107,865	34	148.2	67.7
Substation-Human Err-Contractor	85,067	9	16.3	17.9
O/H Secondary Cable	80,379	248	138.8	152.2
Substation-Switch Failure	71,906	1	78.4	38.6

CAUSES OF OUTAGE EVENTS – **(Absent Adjustments)**

Utility Name: Duke Energy Florida Year:**2021**

All Other Causes Cause (a)	Customer Minutes Of Interruption	Number of Outage Events(N) (b)	Average Duration (L-Bar) (c)	Average Restoration Time (CAIDI) (d)
Transmission-Human Err-Contractor	63,002	2	21.7	17.4
Transmission-Defective Equip	53,595	1	44.9	45.0
Construction Equipment	51,358	33	118.4	162.0
Vandalism	12,429	34	90.5	103.6
Substation-Breaker-Nonpreventable	11,504	1	25.5	10.2
Improper Installation	11,421	26	113.9	92.9
Transmission-Storm	9,640	1	39.8	40.0
Substation-Breaker-Preventable	8,613	1	26.9	27.0
Transmission-Crossarm Failure	7,975	1	55.2	55.0
Substation-Human Error-PGN	7,504	2	1.8	2.0
Substation-Planned Outage	3,210	1	4.6	5.0
Relay-Wiring Error	3,188	4	12.5	12.3
Substation-Regulator Failure	1,046	1	523.2	523.0
Substation-Emergency Shutdown	486	1	1.5	1.0
Transmission-Contact of Lines	414	1	2.9	3.0
All Other Causes	55,011,793	15,656	144.1	64.9

PART II

THREE PERCENT FEEDER LIST - ACTUAL (UNADJUSTED)

Utility Name: Duke Energy Florida, LLC Year: 2021

Primary Circuit Id. No. or Name (a)	Sub-station Origin (b)	Location (c)	Number of Customers					Outage Events "N" (i)	Avg Duration "L-Bar" (j)	CAIDI (k)	Listed Last Year? (l)	No. of Years in the Last 5 (m)	Corrective Action Completion Date (n)
			Residential (d)	Commercial (e)	Industrial (f)	Other (g)	Total (h)						
K1361	ARBUCKLE CREEK	HIGHLANDS	1,089	105	-	14	1,208	7	148.4	52.6	N	1	6/30/22
A186	GE ALACHUA	MONTICELLO	472	88	3	27	555	6	175.1	130.9	N	2	6/30/22
N59	APALACHICOLA	MONTICELLO	1,411	146	2	60	1,498	5	136.0	123.3	N	1	6/30/22
X61	DISSTON	WALSINGHAM	570	422	14	24	1,037	5	121.3	27.6	N	-	12/31/22
N231	EASTPOINT	MONTICELLO	800	144	1	49	981	5	211.7	122.9	N	-	12/31/22
N323	SUWANNEE DISTRIBUTION	MONTICELLO	56	21	-	2	83	5	210.3	99.0	N	1	6/30/22
A90	MEADOW WOODS EAST	MONTICELLO	956	211	3	56	1,204	5	117.0	102.2	Y	3	6/30/22
M1133	EATONVILLE	LONGWOOD	1,232	107	-	10	1,346	4	166.0	90.5	N	-	12/31/22
W0363	SKY LAKE	SE ORLANDO	1,661	492	5	27	2,132	4	131.6	53.3	N	-	12/31/22
K1063	MEADOW WOODS EAST	SE ORLANDO	1,791	87	1	18	1,739	4	115.1	37.3	N	-	12/31/22
M472	PIEDMONT	APOPKA	1,401	146	-	7	1,529	4	133.2	67.5	N	-	12/31/22
W0629	HOLOPAW	SE ORLANDO	932	269	10	27	1,192	4	155.3	93.2	N	-	6/30/22
N43	CARRABELLE	MONTICELLO	1,650	196	-	56	1,886	4	465.0	256.0	N	1	6/30/22
M82	MAITLAND	LONGWOOD	528	84	1	10	597	4	181.0	40.4	N	-	6/30/22
N67	MONTICELLO	MONTICELLO	1,326	247	-	38	1,556	4	150.8	109.6	N	2	6/30/22
K1297	SUN-N-LAKES	HIGHLANDS	1,163	168	-	11	1,337	4	118.3	52.3	N	-	12/31/22
J889	SEMINOLE	WALSINGHAM	3,276	221	-	38	3,509	4	187.7	57.9	N	1	6/30/22
J114	STARKEY	WALSINGHAM	1,114	112	2	10	1,221	4	125.6	41.0	N	-	12/31/22
A45	GEORGIA PACIFIC	MONTICELLO	1,057	250	-	77	1,356	4	138.3	61.8	Y	1	6/30/22
K1196	BABSON PARK	LAKE WALES	801	118	-	17	908	4	112.5	25.5	N	1	6/30/22
A124	WILLISTON	MONTICELLO	1,474	81	-	1	1,509	4	160.4	105.3	N	-	12/31/22
A36	REDDICK	OCALA	934	242	-	19	1,188	4	134.6	48.3	Y	1	6/30/22
K3246	DUNDEE	LAKE WALES	398	41	-	2	433	4	118.9	56.5	N	-	12/31/22
K541	SEBRING EAST	HIGHLANDS	550	53	1	10	620	4	104.8	40.0	N	-	12/31/22
W4564	DELTONA	DELAND	465	329	-	8	805	3	114.0	31.6	N	-	12/31/22
K863	SHINGLE CREEK	BUENA VISTA	2,133	360	-	14	2,430	3	169.1	46.8	N	-	12/31/22
N233	ST. GEORGE ISLAND	MONTICELLO	1,353	154	-	6	1,499	3	164.3	633.2	N	-	12/31/22
N375	WHITE SPRINGS	MONTICELLO	517	107	16	70	730	3	170.4	157.7	N	1	6/30/22
W0808	DELAND	DELAND	1,510	156	6	37	1,680	3	125.1	82.9	N	2	6/30/22
M574	ALTAMONTE	LONGWOOD	1,194	199	-	26	1,412	3	136.5	49.1	N	-	12/31/22
X259	PILSBURY	ST. PETERSBURG	2,429	50	-	8	2,416	3	164.0	57.0	N	-	12/31/22
N58	APALACHICOLA	MONTICELLO	733	197	7	83	1,085	3	111.2	106.2	N	1	6/30/22
X96	CLEARWATER	ST. PETERSBURG	2,579	227	-	74	2,881	3	133.4	56.5	N	-	12/31/22
K959	BOGGY MARSH	BUENA VISTA	798	173	1	5	1,095	3	116.1	43.8	N	-	12/31/22
W0805	DELAND	DELAND	910	153	-	10	1,229	3	115.9	55.6	N	1	6/30/22
M908	FERN PARK	LONGWOOD	586	141	14	12	739	3	143.7	66.9	N	1	6/30/22
W0952	BITHLO	JAMESTOWN	724	54	-	8	775	3	140.8	98.1	N	-	12/31/22
C801	PINELLAS WELL FIELD	SEVEN SPRINGS	-	-	-	1	1	3	133.3	100.0	N	-	12/31/22
X103	FIFTY-FIRST STREET	ST. PETERSBURG	2,356	111	-	16	2,450	3	152.6	92.7	N	-	12/31/22
W0034	DELEON SPRINGS	DELAND	1,307	155	1	21	1,444	3	126.6	96.0	N	-	12/31/22
X51	KENNETH CITY	WALSINGHAM	1,009	125	-	9	1,136	3	116.3	66.2	N	-	12/31/22
W0105	CANOE CREEK	SE ORLANDO	650	133	0	15	706	3	151.6	30.4	N	1	6/30/22

LBAR AND CAIDI Includes all devices.

PSC/ECR 102 (8/06)

Incorporated by reference in Rule 25-6.0455, F.A.C.

PART III

SYSTEM RELIABILITY INDICES – ACTUAL (ABSENT ADJUSTMENTS)

Utility Name: Duke Energy Florida Year: 2021

District or Service Area (a)	SAIDI (b)	CAIDI (c)	SAIFI (d)	MAIFIe (e)	CEMI5 (f)
North Coastal	**124.4**	**92.7**	**1.3**	**5.6**	**1.92%**
Inverness	130.4	87.1	1.5	5.8	1.55%
Monticello	296.1	134.0	2.2	5.9	5.43%
Ocala	127.6	77.4	1.6	4.9	4.43%
Seven Springs	74.4	84.2	0.9	5.8	0.15%
Zephyrhills	100.1	68.2	1.5	4.2	0.66%
South Coastal	**89.8**	**81.1**	**1.1**	**3.8**	**0.20%**
Clearwater	90.4	89.8	1.0	4.5	0.06%
St. Petersburg	82.5	74.7	1.1	3.9	0.29%
Walsingham	97.7	81.0	1.2	3.1	0.22%
North Central	**94.3**	**91.0**	**1.0**	**5.2**	**0.66%**
Apopka	99.6	89.8	1.1	6.5	0.77%
Deland	105.3	87.3	1.2	6.2	0.29%
Jamestown	72.9	91.0	0.8	4.1	0.05%
Longwood	110.5	96.2	1.1	4.5	1.79%
South Central	**77.7**	**70.2**	**1.1**	**4.4**	**0.34%**
Buena Vista	51.6	60.2	0.9	3.3	0.23%
Clermont	96.4	82.9	1.2	4.4	0.11%
SE Orlando	79.1	68.7	1.2	3.5	0.52%
Highlands	101.9	75.6	1.3	8.3	0.13%
Lake Wales	79.1	69.4	1.1	4.9	0.45%
Winter Garden	94.5	75.0	1.3	4.3	0.39%
System	**95.5**	**83.3**	**1.15**	**4.70**	**0.74%**

GENERATION EVENTS – ADJUSTMENTS (Rule 25-6.0455 F.A.C.)

a. Discuss <u>each</u> generation event that resulted in customer outages.

There were no events to report for 2021.

b. Address whether the event was localized or system-wide.

N/A

c. Describe the Company's efforts to avoid or minimize any similar events in the future in terms of the level of costs incurred and outage duration.

N/A

d. Provide the 2021 service reliability data for each generation outage event that is excluded from your Company's 2021 Annual Distribution Reliability Report pursuant to Rule 25-6.0455

Generation Event	N/A
C	N/A
CMI	N/A
CI	N/A
SAIDI	N/A
SAIFI	N/A

Please see Form 103 below.

PART I

CAUSES OF OUTAGE EVENTS – ADJUSTED

Utility Name: Duke Energy Florida, LLC Year: **2021**

Cause (a)	Number of Outage Events(N) (b)	Average Duration (L-Bar) (c)	Average Restoration Time (CAIDI) (d)
Generation	N/A	N/A	N/A
System Totals:	N/A	N/A	N/A

PSC/ECR 103 (8/06)
Incorporated by reference in Rule 25-6.0455, F.A.C.

TRANSMISSION EVENTS – ADJUSTMENTS (Rule 25-6.0455, F.A.C.)

a. Discuss <u>each</u> transmission event that resulted in customer outages.

See Attachment A – "DEF Transmission Outages 2021 - Major Events Excluded."

b. Address whether the event was localized or system-wide.

See Attachment A – "DEF Transmission Outages 2021 - Major Events Excluded."

c. Describe the Company's efforts to avoid or minimize any similar events in the future in terms of the level of costs incurred and outage duration.

Outages are reviewed and investigated by local transmission maintenance staff. The results from these investigations are looked at from a system-perspective by DEF's Transmission Department Asset Management Group to determine if the failure is isolated or similar failures are occurring on another part of the system. When similar failures are noted on the system, further investigation is performed to determine if a solution should be implemented system-wide to remedy the problem. If a project is required, it is submitted for prioritization against other projects.

d. Provide the 2021 service reliability data for each transmission outage event that is excluded from your Company's 2021 Annual Distribution Reliability Report pursuant to Rule 25-6.0455.

There were no events outside of Extreme Weather that resulted in CMI in 2021 per Rule 25-6.0455. This information is reflected in Attachment B – "DEF Transmission Outages 2021 - Major Events Only."

EXTREME WEATHER - EXCLUSIONS (Rule 25-6.0455, F.A.C.)

a. Include in the discussion, the type of weather event, strength (wind speeds/surge-flood levels), locations affected, source of meteorological information and the performance of overhead and underground systems.

Distribution

Dates	Type of Weather Event	Strength (Wind Speeds/surge-flood levels)	Locations affected	Source of Metrological Information	Performance of Overhead and Underground Systems
2/14/2021 - 1:00 AM to 4:59 AM	Tornado	Unknown Wind Speed	Clearwater	National Weather Service	See response to
			Walsingham		Section (d) - pg. 10 of
					Reliability Report
7/5/2021 12:00 PM to 7/8/2021 3:59 PM	Tropical Storm Elsa	39 to 73 mph	Clearwater	National Weather Service	See response to
			Inverness		Section (d) - pg. 10 of
			Monticello		Reliability Report
			Ocala		
			Seven Springs		
			St. Petersburg		
			Walsingham		
			Zephyrhills		
8/10/2021 - 6:00 PM to 6:59 PM	Tornado	Unknown Wind Speed	Seven Springs	National Weather Service	See response to
					Section (d) - pg. 10 of
					Reliability Report
8/15/2021 12:00 AM to 8/17/2021 11:59 PM	Tropical Storm Fred	39 to 73 mph	Monticello	National Weather Service	See response to
					Section (d) - pg. 10 of
					Reliability Report
9/8/2021 5:00 PM to 9/9/2021 4:59 PM	Tropical Storm Mindy	39 to 73 mph	Monticello	National Weather Service	See response to
			Ocala		Section (d) - pg. 10 of
					Reliability Report

Transmission

There were two major Extreme Weather events resulting in CMI that were excluded in 2021. This information is reflected in Attachment B – "DEF Transmission Outages 2021 - Major Events Only."

b. Describe the Company's efforts to avoid or minimize in terms of costs incurred and outage duration any similar events in the future (Example: Reference specific storm hardening activity).

Transmission

These efforts are addressed in "DEF's 2019-2021 Storm Hardening Plan" that was filed on March 1, 2019 (Attachment J).

c. If the method of deriving the weather exclusion is different from the method used for 2015, please explain the changes and provide the CMI and CI for 2021 using the prior method.

For Distribution & Transmission – The same exclusion method has been used for years 2015 through 2021.

d. Provide the 2021 service reliability data for each transmission outage event that is excluded from your Company's 2021 Annual Distribution Reliability Report pursuant to Rule 25-6.0455.

Distribution

Dates	Overhead vs. Underground	C	CMI	CI	Duration	L-Bar	N
2/14/2021 - 1:00 AM to 4:59 AM	OH	301,187	419,149	4,316	3,809	272.1	14
	UG		13,407	89	620	206.7	3
7/5/2021 12:00 PM to 7/8/2021 3:59 PM	OH	929,226	3,991,613	30,598	145,258	218.8	664
	UG		260,414	1,181	23,072	240.3	96
8/10/2021 - 6:00 PM to 6:59 PM	OH	198,491	16,033	165	1,437	159.6	9
	UG		15,521	61	1,130	376.7	3
8/15/2021 12:00 AM to 8/17/2021 11:59 PM	OH	57,422	4,348,192	14,878	45,155	291.3	155
	UG		167,146	142	2,666	533.2	5
9/8/2021 5:00 PM to 9/9/2021 4:59 PM	OH	141,660	1,105,689	6,354	23,702	257.6	92
	UG		2,954	11	2,161	270.2	8

Transmission

There were two major Extreme Weather events resulting in CMI that were excluded in 2021. This information is reflected in Attachment B – "DEF Transmission Outages 2021 - Major Events Only."

OTHER DISTRIBUTION – ADJUSTMENTS (Rule 25-6.0455, F.A.C.)

a. Discuss the causation of each type of distribution event that resulted in customer complaints.

Since DEF has not taken other causations as exclusions for any events in 2021, DEF has no information to report in this section.

b. Describe the Company's efforts to avoid or minimize any similar events in the future in terms of the level of costs incurred and outage duration.

Since DEF has not taken other causations as exclusions for any events in 2021, DEF has no information to report in this section.

c. Provide the 2021 service reliability data for each distribution outage event that is excluded from your Company's 2020 Annual Distribution Reliability Report pursuant to Rule 25-6.0455

i. A table
ii. Electronic file
iii. Causation, Date, CMI, CI Total Repair Cost, etc.

Since DEF has not taken other causations as exclusions for any events in 2021, DEF has no information to report in this section.

2021 ADJUSTED RELIABILITY (Rule 25-6.0455, F.A.C.)

DEF's 2021 annual adjusted SAIDI was 75.3, a 14% decrease from SAIDI observed in 2020 following a 3% decrease from 2019. The primary driver for 2021 was caused by defective-equipment-related outages.

There were 5 days in 2021 that totaled more than 1.0 SAIDI minute each. Each of the 5 days had weather-related outages as the driving factor with more than 70% of the outages for each day being weather-related. These 5 days were April 10th (2.35 SAIDI), April 11th (2.56 SAIDI), June 22nd (1.18 SAIDI), June 24th (1.05 SAIDI), and August 21st (1.21 SAIDI).

In 2021, overall impact to DEF from extreme weather such as tornados and named storms were lower than previous 5-years average. DEF has seen a decline of SAIDI, SAIFI, MAIFIe and CEMI5 over the last 5 years. DEF CAIDI performance has remained steady over the past 5 years. This is driven by DEF's efforts to focus on minimizing outages through investing in the grid.

Year	*2016*	*2017*	*2018*	*2019*	*2020*	*2021*
Adjusted SAIDI	*85.0*	*82.7*	*98.5*	*90.5*	*87.9*	*75.3*

Year	*2016*	*2017*	*2018*	*2019*	*2020*	*2021*
Adjusted SAIFI	*0.98*	*0.92*	*1.01*	*0.97*	*0.94*	*0.84*

a. Causes of outages events – *see attached forms*.

i. 5-yr patterns/trends in outage causation for each of the top 10 causes of outage events, including the frequency, duration, restoration time, cost incurred to restore service, remediation programs and costs.

- See Attachment D – "5 yr Trend by Cause Code" Spreadsheet for 2017 - 2021.

ii. The process used to identify and select the actions to improve the performance in each of the top 10 causes of outages.

DEF prioritizes the reliability improvement action plan by balancing historical and current year performance. System devices are evaluated based on the number of interruptions, customers interrupted (CI), and customer minutes of interruption (CMI). 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.

iii. 2022 activities and budget levels addressing each of the 10 causes of service outage.

- See Attachment E – "2022 Program Budget" Spreadsheet.

b. Three percent Feeder list

i. Identify whether any feeders appear on the 3% listing more than once within a consecutive 5-yr. period and any actions implemented to improve feeder performance.

Feeder W0629:

- DEF Infrared scanned main feeder W0629 in 2020. DEF will continue to scan main feeder of W0629 in June/July 2022.
- W0629 experienced four feeder-level outages in 2021. Two were caused by defective equipment, one was caused by a connector failure and one was caused by a failed underground cable. One of the failed equipment outages was caused by a downed static wire and the other was caused by a recloser during a storm.
- DEF completed backbone trimming in 2020. W0629 is planned to have the backbone and lateral trees trimmed in 2022.
- Operations techs will continue to analyze feeder and perform an in-depth patrol to identify operational issues and initiate mitigation actions.

Feeder A186:

- DEF Infrared scanned main feeder A186 in 2021. No hotspots were found. DEF will continue to scan main feeder of A186 in June/July 2022.
- A186 experienced 3 feeder-level outages in 2021. One outage was caused by a connector failure, one was caused by non-preventable tree damage, and one was caused by preventable tree damage.
- DEF completed backbone tree trimming in 2021 and lateral tree trimming in 2019.
- Operations techs will continue to analyze feeder and perform an in-depth patrol to identify operational issues and initiate mitigation actions.

Feeder A90:

- DEF Infrared scanned main feeder A90 in 2021. No hotspots were found. DEF will continue to scan main feeder of A90 in June/July 2022.
- A90 experienced 3 feeder-level outages in 2021. One outage was caused by a connector failure, one by non-preventable tree damage, and one by vehicle accident damage to a pole.
- DEF completed backbone tree trimming in 2019 and lateral tree trimming in 2018. A90 is planned to have the backbone trees trimmed in 2022.
- DEF is implementing battery storage on A90 that will be energized in 2022.
- Operations techs will continue to analyze feeder and perform an in-depth patrol to identify operational issues and initiate mitigation actions

Feeder N67:

- DEF Infrared scanned main feeder N67 in 2019. One hotspot was found on a capacitor bank which was repaired. DEF will continue to scan main feeder of N67 in June/July 2022.
- N67 experienced 3 feeder-level outages in 2021. One outage was caused by preventable tree damage and two were caused by non-preventable tree damage.
- DEF completed backbone and lateral tree trimming in 2021.
- Operations techs will continue to analyze feeder and perform an in-depth patrol to identify operational issues and initiate mitigation actions.

Feeder W0902:

- DEF Infrared scanned main feeder W0902 in 2019. One hotspot was found on a regular bank, which was repaired, as well as 12 blown arrestor locations that were all replaced. DEF will continue to scan main feeder of M33 in June/July 2022.
- W0902 experienced 2 feeder-level outages in 2021. One outage was caused by non-preventable tree damage and one was caused by equipment misapplication where a recloser failed to open on a fault. The recloser was later replaced.
- DEF completed backbone tree trimming in 2020 and lateral tree trimming in 2018. W0902 is planned to have the backbone trees trimmed in 2022.
- DEF completed a Storm Hardening project in 2019 to reconductor small wire.
- Operations techs will continue to analyze feeder and perform an in-depth patrol to identify operational issues and initiate mitigation actions.

ii. The process used to identify and select the actions to improve the performance of feeders in the 3% feeder list, if any.

DEF prioritizes the reliability improvement action plan for 3% Feeder List by balancing historical and current year performance. Feeders are evaluated based on the number of interruptions, customers interrupted (CI), and customer minutes of interruption (CMI). 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 feeders experiencing multiple interruptions.

iii. 2022 activities and budget levels directed at improving feeder performance.

Feeders are prioritized for maintenance and replacement work based on several criteria including customer minutes of interruption (CMI), number of interruptions, interruption cause code, and CEMI repeat outage performance. This process results in a work plan targeted at feeders and devices with the

greatest impact on reliability indices and customer satisfaction. This process has resulted in consistent and sustained reliability performance.

The 3% feeder list is based solely on number of feeder interruptions and does not take into consideration any of the additional criteria above. While all feeders on the 3% list are patrolled for corrective action, the possibility exists that they could appear on the list more than once due to their relative impact on system reliability indices.

For the 2022 budget levels, please see Attachment E – "2022 Program Budget" Spreadsheet.

c. Regional Reliability Indices – *see attached forms.*

i. 5-Yr. patterns/trends in each regions reliability for each index and on any overall basis.

- See Attachment F – "5 yr Sum by Region" Spreadsheet.

ii. The process used to identify and select actions to improve the regional reliability trends.

- Regional reliability trends are tracked to ensure alignment with the system level goals they support. Specific device-level improvements are measured and prioritized at a system level to ensure maximum benefit for resources expended.

iii. Discuss any 2022 projected activities and budget levels directed at improving regional reliability performance.

- See Attachment E – "2022 Program Budget" Spreadsheet. Regional reliability trends are tracked to ensure alignment with the system-level goals they support. Specific device-level improvements are measured and prioritized at a system level to ensure maximum benefit for resources expended.
- DEF is currently installing new Self-Healing Teams. This system segments the distribution grid to minimize the number of customers affected by a fault. The SCADA communication between the devices and the DEF Distribution Control Center (DCC) allows automatic remote sectionalization to further reduce the number and duration of the outages. DEF currently has 143 teams installed which involves 505 circuits and 932,633 customers (nearly 50% of total DEF customers). In 2022, DEF will continue to install Self-Healing Teams across its service territory.
- In 2021, DEF conducted analysis and reviewed reliability data that meets certain operational thresholds in order to reduce the number of outages and momentary interruptions. From 2020 to 2021, DEF had a 14% reduction in MAIFIe, and the 5-year trend in MAIFIe is downward.

- DEF has begun its Storm Protection Plan in 2021, beginning with the Feeder Hardening Program in distribution. The Feeder Hardening Program will enable the feeder backbone to better withstand extreme weather events by upgrading the feeder backbone to meet NESC 250C extreme wind load standard. This includes strengthening structures, updating BIL (basic insulation level) to current standards, updating conductors to current standards, relocating difficult to access facilities, replacing oil filled equipment as appropriate, and will incorporate the Company's pole inspection and replacement activities. In 2021, DEF completed 46.7 miles of Feeder Hardening.
- DEF will begin the Lateral Harding Program as part of the Storm Protection Plan in 2022. Lateral Hardening is a long-term program that will systematically upgrade and harden branch line sections fed by the feeder backbone. The Lateral Hardening program will enable branch lines to better withstand extreme weather events. This will include undergrounding of the laterals most prone to damage during extreme weather events and overhead hardening of those laterals less prone to damage.
- DEF has begun its Substation Optimization Plan which drives maintenance on entire substations and feeders at once to improve substation and feeder performance. There are 12 substations planned for Substation Optimization in 2022.
- DEF continued its Fuse Replacement Program in 2021, which aims to reduce vegetation and weather-related customer interruptions on some of the feeders most impacted by such outages. Through the Fuse Replacement Program, fuses were replaced on feeders for 49 substations in 2021, with additional substations planned in 2022.

FLORIDA PUBLIC SERVICE COMMISSION
ANNUAL DISTRIBUTION SERVICE RELIABILITY REPORT – ADJUSTED
Top Ten Outage Causes: Form PSC/ECR 102-1(a) (8/06) and Form PSC/ECR 102-1(b) (8/06)

PART I

CAUSES OF OUTAGE EVENTS – **ADJUSTED**

Utility Name: Duke Energy Florida — Year: **2021**

Cause** (a)	Customer Minutes Of Interruption	Number of Outage Events(N) (b)	Average Duration (L-Bar) (c)	Average Restoration Time (CAIDI) (d)
1.) Animals	6,396,798	5,347	80.6	69.5
2.) Vegetation	37,975,866	7,790	153.9	107.9
3.) Lightning	3,438,466	1,126	151.4	109.7
4.) Other Weather	19,352,806	4,060	140.2	103.9
5.) Vehicle	12,355,322	460	241.4	96.8
6.) Defective Equipment	37,663,309	11,449	146.1	82.6
7.) Unknown	2,159,574	688	95.3	52.0
Subtotal	119,342,141	30,920	136.4	92.7
All Other Causes *See attached	23,834,282	7,199	176.3	74.7
System Totals:	143,176,423	38,119	143.9	89.2

PSC/ECR 103 (8/06)
Incorporated by reference in Rule 25-6.0455, F.A.C

CAUSES OF OUTAGE EVENTS – **ADJUSTED**

Utility Name: Duke Energy Florida Year: **2021**

All Other Causes Cause (a)	Customer Minutes Of Interruption	Number of Outage Events(N) (b)	Average Duration (L-Bar) (c)	Average Restoration Time (CAIDI) (d)
U/G Primary Cable	12,828,490	1,075	295.6	103.3
Human Error-Public	3,000,571	430	159.5	109.0
Right-Of-Way	1,904,855	49	63.4	31.8
U/G Secondary/Service	1,658,893	3,686	180.3	220.9
Dig-In	1,379,479	222	190.1	59.0
Overload	663,355	121	139.5	80.3
Human Error-PGN Contractor	655,668	164	105.6	23.2
Foreign Material In Line	578,253	98	95.1	50.9
Miscellaneous	516,810	507	92.3	58.7
Human Error-PGN	389,207	481	74.2	22.6
Equipment Misapplication	107,638	32	152.4	67.7
O/H Secondary Cable	75,895	242	131.6	145.7
Construction Equipment	51,358	33	118.4	162.0
Vandalism	12,389	33	92.0	104.1
Improper Installation	11,421	26	113.9	92.9
All Other Causes	23,834,282	7,199	176.3	74.7

PART II

THREE PERCENT FEEDER LIST – ADJUSTED

Utility Name: DUKE ENERGY FLORIDA, LLC. Year: 2021

PRIMARY CIRCUIT ID. NO. OR NAME (a)	SUBSTATION ORIGIN (b)	LOCATION (c)	CUSTOMERS RESIDENTIAL (d)	CUSTOMERS COMMERCIAL (e)	CUSTOMERS INDUSTRIAL (f)	CUSTOMERS OTHER (g)	CUSTOMERS TOTAL (h)	OUTAGE EVENTS "N" (i)	AVERAGE DURATION "L-Bar" (j)	CAIDI (k)	LISTED LAST YEAR ? (l)	NO. OF YEARS IN THE LAST 5 (m)	CORRECTIVE ACTION COMPLETION DATE (n)
K1361	ARBUCKLE CREEK	HIGHLANDS	1,089	105	-	14	1,208	4	159.4	76.9	N	1	6/30/22
N323	SUWANNEE DISTRIBUTION	MONTICELLO	56	21	-	2	79	4	105.0	72.1	N	1	6/30/22
M82	MAITLAND	LONGWOOD	528	84	1	10	623	4	191.7	39.1	Y	1	6/30/22
A124	WILLISTON	MONTICELLO	1,474	81	-	1	1,556	4	157.8	127.1	N	-	12/31/22
W0629	HOLOPAW	SE ORLANDO	932	269	10	27	1,238	4	164.0	104.0	N	2	6/30/22
J114	STARKEY	WALSINGHAM	1,114	112	2	10	1,238	4	135.2	38.0	N	-	12/31/22
K1063	MEADOW WOODS EAST	SE ORLANDO	1,791	87	1	18	1,897	4	121.4	37.4	N	-	12/31/22
N67	MONTICELLO	MONTICELLO	1,326	247	-	38	1,611	3	136.2	108.5	N	2	6/30/22
K24	LAKE PLACID NORTH	HIGHLANDS	880	79	-	19	978	3	162.0	139.0	N	-	12/31/22
W4564	DELTONA	DELAND	465	329	-	8	802	3	92.3	27.6	N	-	12/31/22
A272	HOMOSASSA	INVERNESS	1,425	184	-	44	1,653	3	176.2	84.9	N	1	6/30/22
X96	BAYWAY	ST. PETERSBURG	2,579	227	-	74	2,880	3	135.5	60.0	N	-	12/31/22
A35	REDDICK	OCALA	437	124	3	12	576	3	133.1	94.1	N	1	6/30/22
W0363	SKY LAKE	SE ORLANDO	1,661	492	5	27	2,185	3	131.7	61.7	N	-	12/31/22
A90	TRENTON	MONTICELLO	956	211	3	56	1,226	3	121.4	140.1	Y	2	6/30/22
K1822	NORTHRIDGE	LAKE WALES	2,203	220	-	14	2,437	3	157.3	45.1	N	-	12/31/22
A98	BROOKSVILLE	INVERNESS	1,301	171	1	17	1,490	3	126.2	93.5	N	-	12/31/22
K3246	DUNDEE	LAKE WALES	398	41	-	2	441	3	123.1	86.6	N	-	12/31/22
C11	CLEARWATER	CLEARWATER	915	274	6	15	1,210	3	138.7	53.4	N	-	12/31/22
M1133	EATONVILLE	LONGWOOD	1,232	107	-	10	1,349	3	170.0	64.7	N	-	12/31/22
C2808	HIGHLANDS	CLEARWATER	109	409	27	13	558	3	125.1	23.8	N	-	12/31/22
N9	PERRY	MONTICELLO	889	211	17	50	1,167	3	92.3	73.0	N	1	6/30/22
C951	ELFERS	SEVEN SPRINGS	1,350	193	-	13	1,556	3	126.3	49.8	N	-	12/31/22
W0391	PINECASTLE	SE ORLANDO	926	418	4	26	1,374	3	107.5	50.6	N	-	12/31/22
J889	SEMINOLE	WALSINGHAM	3,276	221	-	38	3,535	3	183.3	57.3	N	-	6/30/22
X51	KENNETH CITY	WALSINGHAM	1,009	125	-	9	1,143	3	110.1	62.6	N	-	12/31/22
A186	GE ALACHUA	MONTICELLO	472	88	3	27	590	3	169.6	149.0	Y	3	6/30/22
A243	LADY LAKE	OCALA	851	169	-	49	1,069	3	190.0	50.2	N	-	12/31/22
W0515	CASSADAGA	DELAND	884	56	-	31	971	2	147.7	130.8	N	-	12/31/22
A203	ZUBER	OCALA	225	105	-	14	344	2	122.9	73.9	N	-	12/31/22
X215	PASADENA	ST. PETERSBURG	285	111	-	11	407	2	225.2	31.8	N	-	12/31/22
A132	LEBANON	INVERNESS	1,161	139	-	3	1,303	2	170.5	72.1	N	-	12/31/22
C19	CLEARWATER	CLEARWATER	249	81	-	9	339	2	138.8	12.4	N	-	12/31/22
J223	OAKHURST	WALSINGHAM	1,718	45	-	2	1,765	2	169.3	63.8	N	-	12/31/22
W0902	BARBERVILLE	DELAND	1,166	361	1	35	1,563	2	152.1	120.8	N	3	6/30/22
J242	ULMERTON	WALSINGHAM	1,709	566	29	11	2,315	2	121.5	18.5	N	-	12/31/22
M475	PIEDMONT	APOPKA	1,369	84	-	10	1,463	2	135.4	77.5	N	-	12/31/22
J407	LARGO	CLEARWATER	2,251	166	-	23	2,440	2	164.0	116.4	N	-	12/31/22
N327	SOPCHOPPY	MONTICELLO	1,333	165	1	48	1,547	2	145.4	114.3	N	1	6/30/22
A75	BEVERLY HILLS	INVERNESS	2,138	71	-	10	2,219	2	176.0	117.2	N	-	12/31/22
W0329	ECON	JAMESTOWN	843	51	-	19	913	2	169.2	173.3	N	-	12/31/22
J892	SEMINOLE	WALSINGHAM	2437	313	0	24	2774	2	146.71	75.24	N	-	12/31/22

LBAR AND CAIDI Includes all devices.

PART III

SYSTEM RELIABILITY INDICES – ADJUSTED

Utility Name: Duke Energy Florida Year: 2021

District or Service Area (a)	SAIDI (b)	CAIDI (c)	SAIFI (d)	MAIFIe (e)	CEMI5 (f)
North Coastal	**90.0**	**94.6**	**0.95**	**5.4**	**1.10%**
Inverness	112.6	102.7	1.10	5.6	1.28%
Monticello	145.8	111.5	1.31	5.3	2.26%
Ocala	116.4	88.1	1.32	4.8	2.86%
Seven Springs	56.4	90.9	0.62	5.7	0.06%
Zephyrhills	70.3	66.3	1.06	4.2	0.18%
South Coastal	**67.8**	**84.3**	**0.80**	**3.7**	**0.15%**
Clearwater	67.2	90.5	0.74	4.2	0.05%
St. Petersburg	62.5	78.1	0.80	3.8	0.27%
Walsingham	74.5	86.0	0.87	3.0	0.12%
North Central	**81.0**	**97.6**	**0.83**	**5.2**	**0.64%**
Apopka	87.0	108.3	0.80	6.5	0.77%
Deland	90.8	90.4	1.00	6.2	0.29%
Jamestown	64.3	99.5	0.65	4.1	0.05%
Longwood	90.6	92.7	0.98	4.5	1.70%
South Central	**65.2**	**81.4**	**0.80**	**4.4**	**0.28%**
Buena Vista	46.3	70.3	0.66	3.3	0.05%
Clermont	48.7	82.5	0.59	4.4	0.11%
SE Orlando	71.3	74.8	0.95	3.5	0.52%
Highlands	84.0	101.6	0.83	8.3	0.10%
Lake Wales	66.9	91.6	0.73	4.9	0.44%
Winter Garden	84.1	79.6	1.06	4.3	0.35%
SYSTEM	**75.3**	**89.2**	**0.84**	**4.6**	**0.52%**

FEEDER SPECIFIC DATA – Expanded to include OH/UG details

Provide the following information for each feeder circuit in service during 2021. If any data is not available, explain whether the Company has any plans to begin tracking such data and if not, why.

For (A) thru (Y) – See Attachment G – a CD containing Excel File – "2021 Feeder Specific Data."

For (Z) – See Attachment G – "2021 Summer Feeder Peaks."

(A)	Feeder ID	*See Attachment G*
(B)	Sub-Region in which the feeder is located	*See Attachment G*
(C)	Number of overhead lateral lines	*See Attachment G*
(D)	Number of overhead lateral miles	*See Attachment G*
(E)	Number of Customers served on OH lateral lines	*See Attachment G*
(F)	CMI for overhead lateral lines	*See Attachment G*
(G)	CI for overhead lateral lines	*See Attachment G*
(H)	Number of underground lateral lines	*See Attachment G*
(I)	Number of underground lateral miles	*See Attachment G*
(J)	Number of customers served on UG lateral lines	*See Attachment G*
(K)	CMI for underground lateral lines	*See Attachment G*
(L)	CI for underground lateral lines	*See Attachment G*
(M)	Number of automatic line sectionalizing devices on the lateral lines	*See Attachment G*
(N)	Number of automatic line sectionalizing devices on the feeder	*See Attachment G*
(O)	Whether the feeder circuit is looped	*See Attachment G*
(P)	Total length of the feeder circuit	*See Attachment G*
(Q)	Length of underground portion of the feeder circuit	*See Attachment G*
(R)	Number of customers served by underground feeders	*See Attachment G*
(S)	CMI for underground feeders	*See Attachment G*
(T)	CI for underground feeders	*See Attachment G*
(U)	Length of overhead portion of the feeder circuit	*See Attachment G*
(V)	Number of customers served by overhead feeders	*See Attachment G*
(W)	CMI for overhead feeders	*See Attachment G*
(X)	CI for overhead feeders	*See Attachment G*
(Y)	Load growth since December 31, 2009	*See Attachment G*
(Z)	Peak load recorded through December 31, 2009	*See Attachment G*

DISTRIBUTION SUBSTATION (Rule 25-6.0455, F.A.C.)

a. Describe the five-year patterns/trends in reliability performance of distribution substations.

The five-year patterns/trends in reliability performance of distribution substations is best described by the performance indices. These indices are used for calculating system reliability:

- SAIDI – System Average Interruption Duration Index (minutes/customer). SAIDI reflects the average number of minutes a customer was without power system-wide. It is determined by dividing the sum of customer-minutes of interruption by the average number of customers served during a period.

- CAIDI – Customer Average Interruption Duration Index (minutes/customer). CAIDI is the average customer-minutes of interruption per customer interruption. It approximates the average length of time required to complete service restoration. It is determined by dividing the sum of all customer-minutes of interruption durations by the number of customer interruptions during a period. CAIDI measures how long it takes DEF to restore service after an interruption.

- SAIFI – System Average Interruption Frequency Index. SAIFI is the average number of interruptions per customer per a certain period. It is determined by dividing the total number of customer interruptions by the average number of customers served during a period.

- OHMY – Outages per Hundred Miles per Year. OHMY measures the number of forced transmission line events, momentary AND sustained, that are incurred per hundred circuit miles per year. This measure is often grouped by voltage class.

The following charts will show the trending for these Reliability Indices:

Section	Grid SAIDI	SECI SAIDI	Retail SAIDI
North	1.16	2.83	0.6
Central	2.24	1.30	2.9
Coastal	1.90	1.50	2.2
Florida	5.30	5.63	5.7

Table 1: 2021 DEF SAIDI Reliability Indices

In 2021, Grid SAIDI decreased (improved) from 2020 and SECI (Seminole Electric Cooperatives, Inc.). SAIDI also decreased from 2020. SECI represents its electric cooperative members in Florida.

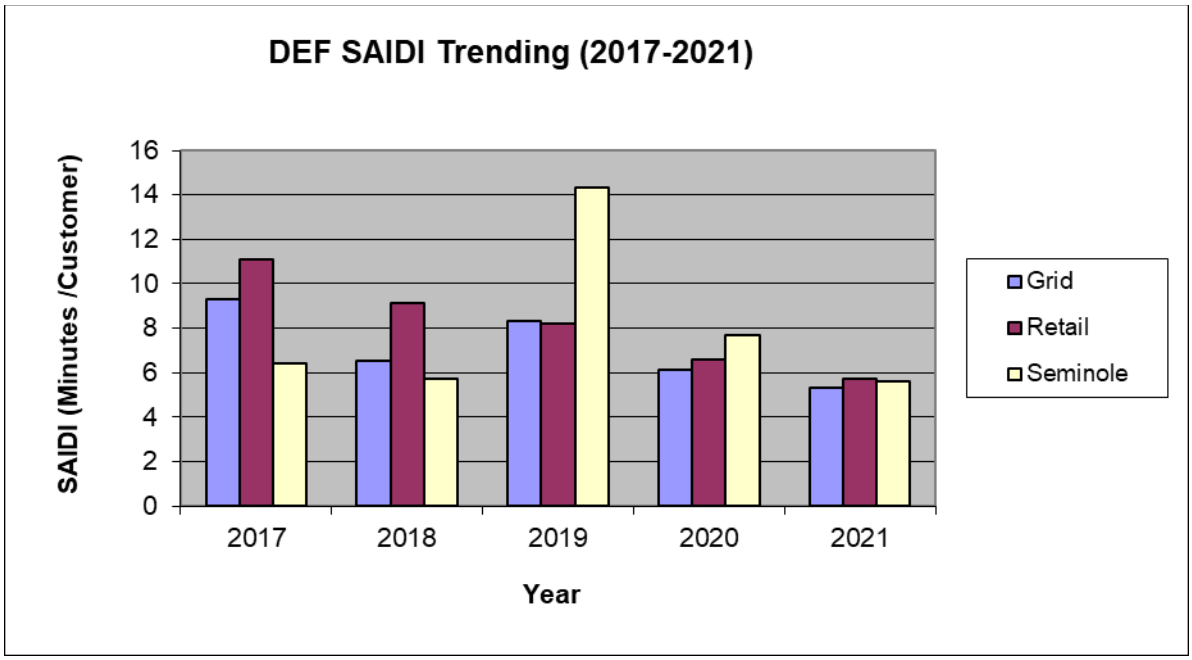


Fig.1: DEF SAIDI Trending (2017 - 2021)

Grid KPIs	2017	2018	2019	2020	2021
Customers (Thousands)	533.33	440.34	429.79	432.19	291.04
CMI (Millions)	21.7	20.85	25.04	17.83	14.63
SAIDI	9.3	6.5	8.3	6.1	5.3
CAIDI	40.69	43.33	58.26	41.39	58.3
SAIFI	0.22	0.19	0.14	0.15	0.10
FSO	N/A	N/A	N/A	N/A	N/A
FOHMY	9.75	9.92	8.12	8.74	7.50

Table 2: DEF Statistics (2017 - 2021)

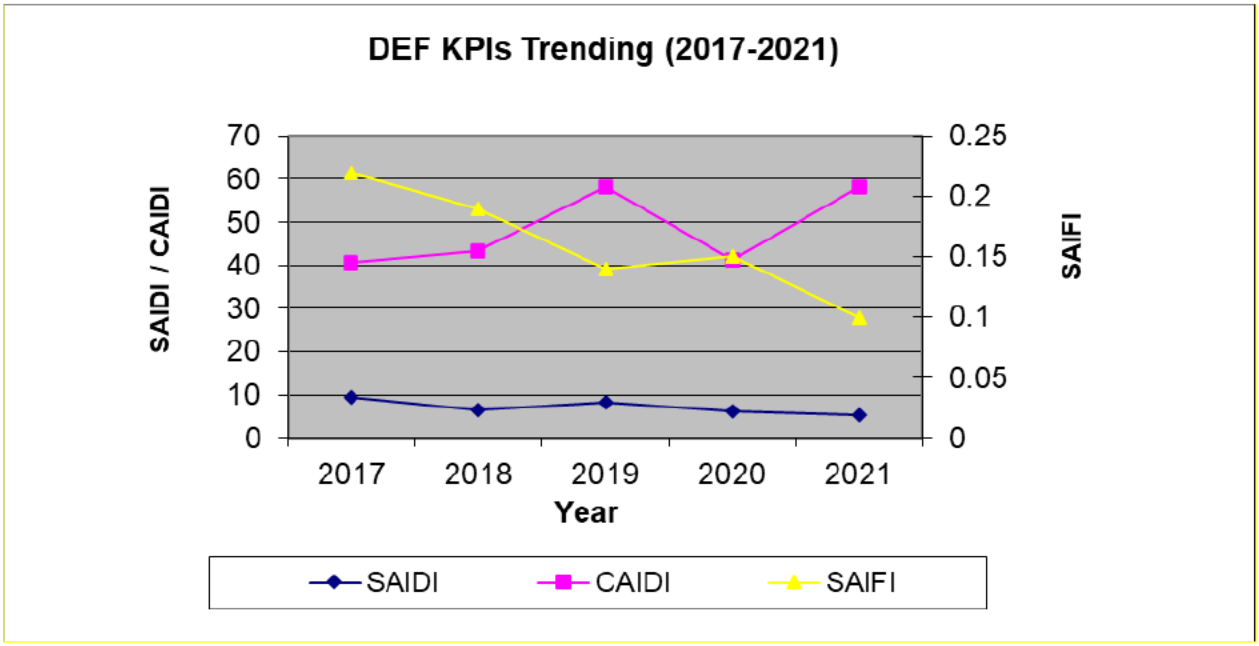


Fig.2: DEF Key Performance Indicators Trending (2017 - 2021)

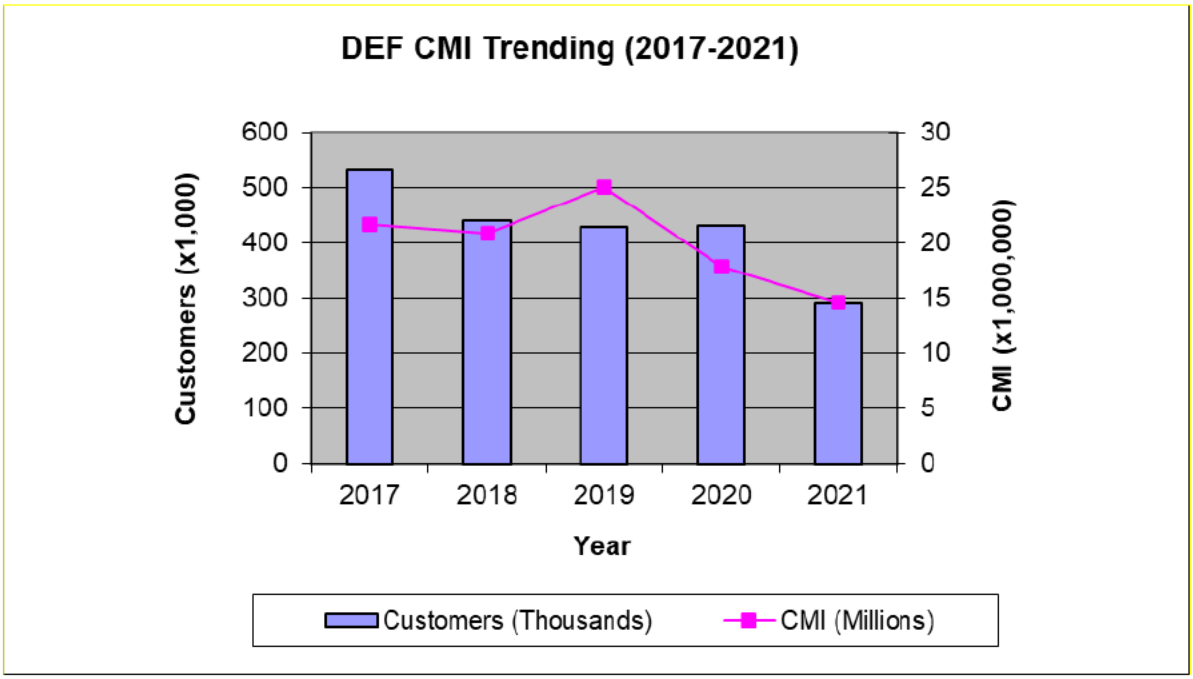


Fig.3: DEF Customers Minute Interruption Trending (2017 - 2021)

DEF CMI Per Month (2017 - 2021)

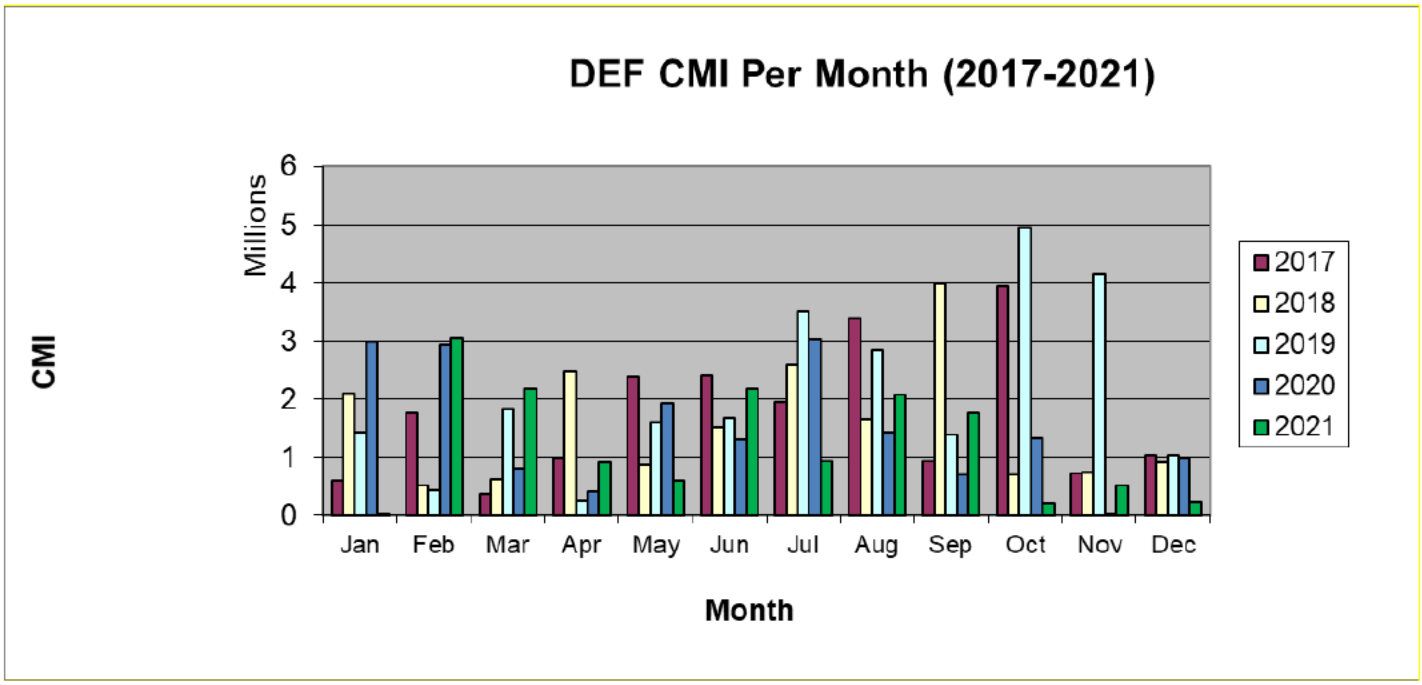


Fig.4: DEF CMI per month (2017 - 2021)

a. Describe Company efforts to track the reliability of distribution substations.

DEF's in-house database, Transmission Outage Management System (TOMS), is used to keep track and record all the events that occur every day. It maintains all the indices mentioned above.

b. Describe the process used by your Company to identify and select the actions to promote substation reliability.

To identify and promote substation reliability, DEF uses different methods, such as monthly substation inspections, predictive and preventive maintenance, infra-red analysis and numerous diagnostics tests. Once a problem is identified, DEF's work management tool is used to track the efforts to correct it.

c. Provide the number of distribution substations inspected during normal operations (non-storm related) for 2007 through 2021.

DEF has inspected each of its current 515 substations.

SUPPLEMENTAL DISTRIBUTION INFORMATION

The next six pages contain the following information:

2021

	Unadjusted Data		Adjusted Data	
	CMI	CI	CMI	CI
NORTH CENTRAL	**40,381,691**	**443,587**	**34,718,857**	**355,686**
APOPKA	10,584,949	117,932	9,252,265	85,404
DELAND	9,163,677	104,973	7,904,482	87,485
JAMESTOWN	10,337,322	113,634	9,124,222	91,740
LONGWOOD	10,295,743	107,048	8,437,888	91,057
NORTH COASTAL	**55,588,813**	**599,975**	**40,201,549**	**425,127**
INVERNESS	10,304,137	118,238	8,902,029	86,640
MONTICELLO	17,003,085	126,903	8,369,375	75,036
OCALA	10,750,083	138,973	9,806,542	111,250
SEVEN SPRINGS	14,771,682	175,375	11,187,399	123,008
ZEPHYRHILLS	2,759,826	40,486	1,936,204	29,193
SOUTH CENTRAL	**42,338,865**	**603,454**	**35,555,364**	**437,029**
BUENA VISTA	7,638,034	126,825	6,850,959	97,501
CLERMONT	3,862,203	46,569	1,952,843	23,674
HIGHLANDS	5,741,021	75,957	4,735,202	46,624
LAKE WALES	9,310,209	134,232	7,875,758	85,993
SE ORLANDO	7,670,383	111,627	6,911,976	92,441
WINTER GARDEN	8,117,015	108,244	7,228,626	90,796
SOUTH COASTAL	**43,307,677**	**534,125**	**32,700,653**	**387,936**
CLEARWATER	13,300,318	148,159	9,896,108	109,367
ST. PETERSBURG	14,960,457	200,174	11,328,759	145,073
WALSINGHAM	15,046,902	185,792	11,475,786	133,496
Grand Total	**181,617,046**	**2,181,141**	**143,176,423**	**1,605,778**

CEMI5 Unadjusted Report - 2021

INTERRUPTIONS:	1	2	3	4	5	6	7	8	9	10 +	Cust >5	CEMI >5
NORTH CENTRAL												
Apopka	38,155	12,513	3,808	1,042	406	445	194	148	13	24	824	**0.77%**
Deland	27,332	13,239	7,006	1,672	535	124	90	39	2	1	256	**0.29%**
Jamestown	46,193	14,970	4,231	704	288	67	5	2			74	**0.05%**
Longwood	23,681	9,991	5,067	2,947	1,934	567	346	203	165	386	1667	**1.79%**
NORTH CENTRAL	**135,361**	**50,713**	**20,112**	**6,365**	**3,163**	**1,203**	**635**	**392**	**180**	**411**	**2,821**	**0.66%**
NORTH COASTAL												
Inverness	18,823	14,369	7,081	2,721	1,014	815	187	113	48	64	1,227	**1.55%**
Monticello	19,512	10,892	6,565	3,227	1,360	1,526	677	545	160	206	3,114	**5.43%**
Ocala	21,528	10,973	6,594	3,957	2,258	1,719	976	701	210	131	3,737	**4.43%**
Seven Springs	60,803	21,702	5,925	1,662	625	285	20				305	**0.15%**
Zephyrhills	5,415	4,362	3,892	1,649	236	133	35	13			181	**0.66%**
NORTH COASTAL	**126,081**	**62,298**	**30,057**	**13,216**	**5,493**	**4,478**	**1,895**	**1,372**	**418**	**401**	**8,564**	**1.92%**
SOUTH CENTRAL												
Buena Vista	48,954	10,430	6,983	1,014	2,506	284	61	1			346	**0.23%**
Clermont	19,376	4,895	2,508	442	100	36		9			45	**0.11%**
Highlands	15,034	10,913	3,866	1,535	220	14	9	45		4	72	**0.13%**
Lake Wales	35,342	13,999	5,099	1,925	636	231	152	74	58	17	532	**0.45%**
SE Orlando	24,090	9,894	6,324	5,793	867	292	94	53	16	50	505	**0.52%**
Winter Garden	33,366	13,305	6,006	1,489	406	229	78	23		4	334	**0.39%**
SOUTH CENTRAL	**176,162**	**63,436**	**30,786**	**12,198**	**4,735**	**1,086**	**394**	**205**	**74**	**75**	**1,834**	**0.34%**
SOUTH COASTAL												
Clearwater	43,964	12,752	9,856	1,611	608	81	12				93	**0.06%**
St. Petersburg	59,956	24,518	9,222	2,276	1,002	271	135	7	86	27	526	**0.29%**
Walsingham	46,252	27,157	6,966	3,488	1,589	232	103	1			336	**0.22%**
SOUTH COASTAL	**150,172**	**64,427**	**26,044**	**7,375**	**3,199**	**584**	**250**	**8**	**86**	**27**	**955**	**0.20%**
System:	**587,776**	**240,874**	**106,999**	**39,154**	**16,590**	**7,351**	**3,174**	**1,977**	**758**	**914**	**14,174**	**0.74%**

CEMI5 Adjusted Report - 2021

INTERRUPTIONS:		1	2	3	4	5	6	7	8	9	10 +	Cust >5	CEMI >5
NORTH CENTRAL													
	Apopka	37,754	11,606	3,339	1,004	391	445	194	148	13	24	824	**0.77%**
	Deland	27,358	14,200	6,268	1,439	521	124	90	39	2	1	256	**0.29%**
	Jamestown	43,976	14,207	4,161	726	266	67	5	2			74	**0.05%**
	Longwood	21,861	10,886	3,783	2,676	1,824	535	332	168	165	386	1,586	**1.70%**
	NORTH CENTRAL	**130,949**	**50,899**	**17,551**	**5,845**	**3,002**	**1,171**	**621**	**357**	**180**	**411**	**2,740**	**0.64%**
NORTH COASTAL													
	Inverness	19,145	13,556	5,824	2,303	714	641	198	73	37	64	1,013	**1.28%**
	Monticello	15,678	8,080	4,835	2,558	1,463	701	392	162	40	3	1,298	**2.26%**
	Ocala	21,827	11,081	6,606	4,025	2,350	1,265	598	386	108	52	2,409	**2.86%**
	Seven Springs	56,176	18,350	4,979	1,201	648	115	8				123	**0.06%**
	Zephyrhills	6,592	4,777	3,048	426	177	37	11	2			50	**0.18%**
	NORTH COASTAL	**119,418**	**55,844**	**25,292**	**10,513**	**5,352**	**2,759**	**1,207**	**623**	**185**	**119**	**4,893**	**1.10%**
SOUTH CENTRAL													
	Buena Vista	44,262	10,160	5,504	2,993	374	81					81	**0.05%**
	Clermont	12,903	3,286	672	304	30	36	4	5			45	**0.11%**
	Highlands	15,272	8,243	2,935	903	116	8		47	1	1	57	**0.10%**
	Lake Wales	31,085	11,959	4,835	1,866	539	223	170	91	35	2	521	**0.44%**
	SE Orlando	24,788	7,784	6,045	5,753	855	290	94	59	10	50	503	**0.52%**
	Winter Garden	33,356	13,302	6,096	1,517	321	217	62	18		4	301	**0.35%**
	SOUTH CENTRAL	**161,666**	**54,734**	**26,087**	**13,336**	**2,235**	**855**	**330**	**220**	**46**	**57**	**1,508**	**0.28%**
SOUTH COASTAL													
	Clearwater	42,508	13,178	7,904	982	485	76	2				78	**0.05%**
	St. Petersburg	53,695	25,592	5,598	1,162	865	267	99	34	59	27	486	**0.27%**
	Walsingham	45,652	21,696	5,603	3,010	989	177	3	1			181	**0.12%**
	SOUTH COASTAL	**141,855**	**60,466**	**19,105**	**5,154**	**2,339**	**520**	**104**	**35**	**59**	**27**	**745**	**0.15%**
	System	**553,888**	**221,943**	**88,035**	**34,848**	**12,928**	**5,305**	**2,262**	**1,235**	**470**	**614**	**9,886**	**0.52%**

MAIFIe - Unadjusted (01/01/2021 - 12/31/2021)

	Customers Served	# momentary events	CME	MAIFIe	
North Central					
Apopka	106,314	509	687,115	6.5	From 1/1/2021 to 12/31/2021
Deland	87,056	372	541,851	6.2	From 1/1/2021 to 12/31/2021
Jamestown	141,873	334	581,947	4.1	From 1/1/2021 to 12/31/2021
Longwood	93,151	324	422,294	4.5	From 1/1/2021 to 12/31/2021
North Central Total	428,394	1,539	2,233,207	5.2	From 1/1/2021 to 12/31/2021
North Coastal					
Inverness	79,034	319	462,290	5.8	From 1/1/2021 to 12/31/2021
Monticello	57,422	375	340,602	5.9	From 1/1/2021 to 12/31/2021
Ocala	84,238	310	416,485	4.9	From 1/1/2021 to 12/31/2021
Seven Springs	198,491	562	1,147,206	5.8	From 1/1/2021 to 12/31/2021
Zephyrhills	27,557	54	116,288	4.2	From 1/1/2021 to 12/31/2021
North Coastal Total	446,742	1,620	2,482,871	5.6	From 1/1/2021 to 12/31/2021
South Central					
Buena Vista	147,935	363	482,467	3.3	From 1/1/2021 to 12/31/2021
Clermont	40,066	108	175,571	4.4	From 1/1/2021 to 12/31/2021
Highlands	56,354	327	465,771	8.3	From 1/1/2021 to 12/31/2021
Lake Wales	117,656	385	577,316	4.9	From 1/1/2021 to 12/31/2021
SE Orlando	96,976	274	337,585	3.5	From 1/1/2021 to 12/31/2021
Winter Garden	85,928	231	371,783	4.3	From 1/1/2021 to 12/31/2021
South Central Total	544,915	1,688	2,410,493	4.4	From 1/1/2021 to 12/31/2021
South Coastal					
Clearwater	147,161	341	664,082	4.5	From 1/1/2021 to 12/31/2021
St. Petersburg	181,297	349	703,279	3.9	From 1/1/2021 to 12/31/2021
Walsingham	154,026	285	476,503	3.1	From 1/1/2021 to 12/31/2021
South Coastal Total	482,484	975	1,843,864	3.8	From 1/1/2021 to 12/31/2021
	1,902,535	5,822	8,970,435	4.7	From 1/1/2021 to 12/31/2021

MAIFIe - Adjusted (01/01/2021 - 12/31/2021)

	Customers Served	# momentary events	CME	MAIFIe	
North Central					
Apopka	106,314	509	687,115	6.5	From 1/1/2021 to 12/31/2021
Deland	87,056	372	541,851	6.2	From 1/1/2021 to 12/31/2021
Jamestown	141,873	334	581,947	4.1	From 1/1/2021 to 12/31/2021
Longwood	93,151	324	422,294	4.5	From 1/1/2021 to 12/31/2021
North Central Total	428,394	1,539	2,233,207	5.2	From 1/1/2021 to 12/31/2021
North Coastal					
Inverness	79,034	305	444,342	5.6	From 1/1/2021 to 12/31/2021
Monticello	57,422	335	302,327	5.3	From 1/1/2021 to 12/31/2021
Ocala	84,238	300	405,616	4.8	From 1/1/2021 to 12/31/2021
Seven Springs	198,491	555	1,134,099	5.7	From 1/1/2021 to 12/31/2021
Zephyrhills	27,557	54	116,288	4.2	From 1/1/2021 to 12/31/2021
North Coastal Total	446,742	1,549	2,402,672	5.4	From 1/1/2021 to 12/31/2021
South Central					
Buena Vista	147,935	363	482,467	3.3	From 1/1/2021 to 12/31/2021
Clermont	40,066	108	175,571	4.4	From 1/1/2021 to 12/31/2021
Highlands	56,354	327	465,771	8.3	From 1/1/2021 to 12/31/2021
Lake Wales	117,656	385	577,316	4.9	From 1/1/2021 to 12/31/2021
SE Orlando	96,976	274	337,585	3.5	From 1/1/2021 to 12/31/2021
Winter Garden	85,928	231	371,783	4.3	From 1/1/2021 to 12/31/2021
South Central Total	544,915	1,688	2,410,493	4.4	From 1/1/2021 to 12/31/2021
South Coastal					
Clearwater	147,161	309	611,470	4.2	From 1/1/2021 to 12/31/2021
St. Petersburg	181,297	343	691,859	3.8	From 1/1/2021 to 12/31/2021
Walsingham	154,026	275	461,040	3.0	From 1/1/2021 to 12/31/2021
South Coastal Total	482,484	927	1,764,369	3.7	From 1/1/2021 to 12/31/2021
	1,902,535	5,703	8,810,741	4.6	From 1/1/2021 to 12/31/2021

SYSTEM RELIABILITY INDICES – ABSENT ADJUSTMENTS
Utility Name: Duke Energy Florida, LLC

2021

Region	Operation Center	SAIDI
NORTH COASTAL		124.4
	Inverness	130.4
	Monticello	296.1
	Ocala	127.6
	Seven Springs	74.4
	Zephyrhills	100.1
SOUTH COASTAL		89.8
	Clearwater	90.4
	St. Petersburg	82.5
	Walsingham	97.7
NORTH CENTRAL		94.3
	Apopka	99.6
	Deland	105.3
	Jamestown	72.9
	Longwood	110.5
SOUTH CENTRAL		77.7
	Buena Vista	51.6
	Clermont	96.4
	Highlands	101.9
	Lake Wales	79.1
	SE Orlando	79.1
	Winter Garden	94.5
SYSTEM		95.5

Note: SAIDI indices are the contribution to the system level.

SYSTEM RELIABILITY INDICES – ADJUSTED
Utility Name: Duke Energy Florida, LLC

2021

Region	Operation Center	SAIDI
NORTH COASTAL		90.0
	Inverness	112.6
	Monticello	145.8
	Ocala	116.4
	Seven Springs	56.4
	Zephyrhills	70.3
SOUTH COASTAL		67.8
	Clearwater	67.2
	St. Petersburg	62.5
	Walsingham	74.5
NORTH CENTRAL		81.0
	Apopka	87.0
	Deland	90.8
	Jamestown	64.3
	Longwood	90.6
SOUTH CENTRAL		65.2
	Buena Vista	46.3
	Clermont	48.7
	Highlands	84.0
	Lake Wales	66.9
	SE Orlando	71.3
	Winter Garden	84.1
SYSTEM		75.3

Note: SAIDI indices are the contribution to the system level.

RELIABILITY RELATED CUSTOMER COMPLAINTS

Please see Attachment H for DEF's spreadsheet comparing DEF vs. PSC 2021 reliability-related complaints.

a. Describe the five year patterns/trends in reliability related customer complaints.

DEF receives its customer complaints from the FPSC via a variety of methods (Formal Complaints, Courtesy Calls and Internet Transfers). The 5-year trend is shown below with DEF reliability-related complaint data:

		FPSC Formal (15 Day/Logged) Complaints			
Complaint Category		Year End Total			
	2017	2018	2019	2020	2021
Outages - Momentary	6	8	7	15	11
Outages - Frequent	35	77	47	35	22
Outages – Extended	23	10	13	7	2
Voltage	2	3	7	10	2
Equipment/Facilities	10	16	13	12	18
Tree Trimming	6	6	8	7	3
Safety	0	0	0	0	0
Total	82	120	95	86	58

b. Describe Company efforts to correlate reliability related complaints with reliability indices for applicable feeder, lateral and subregion.

Reliability complaints are typically driven by localized delivery system performance. The most effective remedy is surgical corrective action based on patrol/survey of a discrete segment in conjunction with analysis of outage cause(s) and duration. Corrective action scope is typically increased when appropriate to ensure maximum impact on established reliability indices such as SAIDI, MAIFIe, CEMI4 and CELID3.

c. Describe the process used by your company to identify and select systematic actions to improve reliability due to customer complaints (if no such program exists explain why).

Systematic corrective actions are prioritized based on expected improvement to established reliability indices such as SAIDI, MAIFIe, CEMI4 and CELID3. Reliability complaints are typically driven by localized delivery system performance. The most effective remedy is surgical corrective action based on patrol/survey of a discrete segment in conjunction with analysis of outage cause(s) and duration. Corrective actions are compared to the reliability work plan to ensure no unnecessary duplication of effort.

WOOD POLE INSPECTION PROGRAM

a. Provide a detailed description of the Company's wood pole inspection program.

DEF's wood pole inspection program's philosophy is to determine the condition of the wood pole plant and provide remediation for any wood poles that are showing signs of decay or fall below the minimum strength requirements outlined by NESC standards.

DEF is utilizing the expertise of GeoForce Utility Technologies and Davey Resources Group for distribution and EN Engineering for transmission to perform the inspections on an eight-year cycle. Transmission inspection includes visual inspection with Resistograph sound and bore. Transmission wood poles identified as not meeting Standards are prioritized and scheduled for replacement. Distribution inspections include visual inspection, sound and boring and full excavation down to 18 inches below ground line to determine the condition of all poles except for CCA poles less than 16 years of age and poles that cannot be excavated due to obstructions. For CCA poles less than 16 years of age, inspections include visual and sound as well as selective boring to determine the pole condition. Distribution inspections are providing remediation of decayed poles through external and internal treatments. In distribution, if the pole is below NESC standards and has the minimum remaining wood above ground line, reinforcement of the pole with steel C-trusses is often performed to bring the pole back to original strength.

For additional information, please see Attachment K – "Transmission – Wood & Non-Wood Inspection Guidelines - TECP-MIM-TRM-00118-Rev.004 & TECP-MIM-TRM-00121-Rev. 002."

b. 2021 accomplishments

Distribution

DEF inspected 121,225 wood distribution poles during 2021. This completes the second eight-year inspection cycle. In addition to the inspections, GPS coordinates and physical attributes were updated and/or verified, and inspection results were collected in a central database on all poles inspected.

The distribution wood pole inspection program is planned to complete approximately 1/8 of the distribution pole fleet per year. In cycle 1, the route of the inspections was performed to inspect the coastal poles first, moving inland as the program proceeded. Cycle 2 was conducted in a manner that provides a more even distribution of work to DEF's engineering and line resources. Cycle 3 we will be inspecting by Circuit ID.

Transmission

In 2021, DEF's Transmission Ground Patrols/Sound & Bore inspected 3,860 wood pole structures. This represents approximately 21.1% of the wood pole structures on the DEF Transmission system. For the summary report of the inspection data, See Attachment Attachment L – "DEF's 2021 Annual Wood Pole Inspection Report," filed with the FPSC on February 28, 2022. For a full report of inspection data – See Attachment M – a CD containing Excel file – "2021 Florida Pole Inspection Data."

Projected accomplishments for 2022

Distribution

DEF's goal for 2022 is to commence Cycle 3 inspections of the system. DEF will continue to utilize the same inspection procedures in 2022 that were used in the past. Projected cost for the 2022 distribution pole inspection program is $3.64M.

Transmission

Plans for 2022 are to perform visual and sounding inspections on 1/4 of the wood pole system and Resistograph sound and bore inspections on at least 1/8 of the wood pole system. DEF Transmission plans to inspect at least 1/6 of our non-wood system. All three inspections: wood – visuals, Resistograph sound & bore and non-wood visual inspections are performed by a contractor. The entire transmission system will also be aerially patrolled twice via helicopter in 2022.

c. Wood pole inspection reports.

Each wood pole inspection report contains the following:

- A description of the methods used for structural analysis and pole inspection;
- A description of the selection criteria that was used to determine which poles would be inspected; and
- A summary report of the inspection data.

Distribution

Please see Attachment L – "DEF's 2021 Annual Wood Pole Inspection Report," filed with the FPSC on February 28, 2022.

For a description of the methods used for structural analysis and pole inspection, please refer to Attachment K – "Wood Pole Inspection Plan," pages 6 - 8.

For the full report of the inspection data, See Attachment M – a CD containing Excel file – "2021 DEF Distribution Pole Inspection Data."

Transmission

Please see Attachment L – "DEF's 2021 Annual Wood Pole Inspection Report," filed with the FPSC on February 28, 2022.

For a description of the methods used for structural analysis and pole inspection, please refer to Attachment K – "Wood Pole Inspection Plan."

For the full report of the inspection data, See Attachment M – a CD containing Excel file – "2021 Florida Pole Inspection Data."

CCA Pole Sampling Report

Pursuant to Order No. PSC-08-0615-PAA-EI issued September 23, 2008 in Docket No. 080219-EI, the FPSC approved modification to the sounding and boring excavation requirements of Order No. 06-0144-PAA-EI with regard to CCA wood poles less than 16 years old. On Pages 3 and 4 of Order No. PSC-08-0615-PAA-EI, it states,

> *"ORDERED that, consistent with the deviation granted to Gulf Power Company in Order No. PSC-07-0078-PAA-EU, Progress Energy Florida, Inc., Florida Power & Light Company, and Tampa Electric Company shall be required to sound and selectively bore all CCA poles under the age of 16 years, but shall not be required to perform full excavation on these poles. It is further*
>
> *ORDERED that Progress Energy Florida, Inc., Florida Power & Light Company, and Tampa Electric Company shall also be required to perform full excavation sampling to validate their inspection method. It is further*
>
> *ORDERED that the results of the utilities' sampling shall be filed in their annual distribution reliability reports."*

2021 CCA Pole Sampling Results

Please see Attachment L – "DEF's 2021 Annual Wood Pole Inspection Report" filed with the FPSC on February 28, 2022. The "CCA Sampling Results for 2021" is included in DEF's Wood Pole Inspection Report as "Attachment B."

Reliability Report Attachment Index

ATTACHMENT A

OUTAGE_ID	LOCATION	OUTAGE_START_TIME	INITIATING_CAUSE	SUSTAINED_CAUSE	RETAIL_CMI	GRID_CMI
82,958	Fort White (FWHT) - Jasper South (JASS) 69kV Line	03/28/2021 09:19:03	Line Equipment - Crossarm	Line Equipment - Crossarm	0	12,932
85,604	Occidental Swift Creek 1 (OSC1) - Occidental Metering (OXYM) 115kV Line	07/07/2021 17:00:32	Weather/Environment - Hurricane	Weather/Environment - Hurricane	9,596	9,596
82,770	FIFTY FIRST ST*	03/18/2021 00:38:00	Breaker Equipment - Interrupters	Breaker Equipment - Interrupters	1,088,560	1,088,560
83,702	CLERMONT*	05/02/2021 10:49:00	Animal - Squirrel	Animal - Squirrel	196,251	196,251
83,884	UCF	05/20/2021 09:28:56	Animal - Squirrel	Animal - Squirrel	126,917	126,917
83,720	WELCH ROAD	04/14/2021 09:08:54	Breaker Equipment - Failed to Reclose	Breaker Equipment - Failed to Reclose	53,512	53,512
84,072	SAND LAKE*	06/01/2021 21:20:30	Human Error - Construction (PD Contractor)	Human Error - Construction (PD Contractor)	21,048	21,048
84,798	CROSS BAYOU*	06/04/2021 01:08:12	Line Equipment - Insulator (Line, Porcelain)	Line Equipment - Insulator (Line, Porcelain)	190,536	190,536
82,802	(GEC) Lake Josephine (LSJ9) Load	03/19/2021 01:25:18	Animal - Other Animal	Animal - Other Animal	0	402,405
82,104	Vandolah (VAND) - (PRECO) Murphy Road (MRF1) 69kV Line	02/07/2021 00:57:22	Lightning - Lightning,Correlated in lightning detection systm)	Lightning - Lightning,Correlated in lightning detection systm)	0	5,032
82,106	High Springs (HISP) 69kV Bus 1	02/06/2021 21:14:05	Relay and Control Systems - Voltage Transformer Failure (PT, CCPD, CCVT, etc.)	Relay and Control Systems - Voltage Transformer Failure (PT, CCPD, CCVT, etc.)	369,207	1,065,979
82,108	High Springs (HISP) - Hull Road (HULL) 69kV Line	02/06/2021 21:14:05	Relay and Control Systems - Voltage Transformer Failure (PT, CCPD, CCVT, etc.)	Human Error - Incorrect Relay Setting	9,822	37,135
82,574	BOGGY MARSH	03/04/2021 01:58:45	Animal - Other Animal	Breaker Equipment - Electrical Controls/Circuitry	453,720	453,720
82,850	AVON PARK*	03/23/2021 10:37:10	Human Error - Maintenance Personnel (Power Delivery)	Human Error - Maintenance Personnel (Power Delivery)	6,726	6,726
85,226	River Junction (RIVJ) BK1	06/27/2021 17:55:22	Lightning - Lightning,Observed striking line or equipment	Relay and Control Systems - Relay Failure/Misoperation	0	203,292
84,754	Fort White (FWHT) - Jasper South (JASS) 115kV East Circuit	06/15/2021 16:04:00	Lightning - Lightning,Correlated in lightning detection systm)	Lightning - Lightning,Correlated in lightning detection systm)	0	17,604
84,800	ULMERTON WEST*	06/04/2021 01:19:34	Line Equipment - Insulator (Line, Porcelain)	Line Equipment - Insulator (Line, Porcelain)	2,515	2,515
83,600	Mulberry (MLBY) - Northwest City of Bartow (NWST) 69kV Line	05/05/2021 07:09:14	Customer / Other Util Equip Problems - Customer's Line Equipment (Non-Duke)	Relay and Control Systems - Relay Failure/Misoperation	0	3
84,052	DELAND*	05/29/2021 19:26:19	Breaker Equipment - Failed to Reclose	Breaker Equipment - Electrical Controls/Circuitry	76,230	76,230
84,076	EUSTIS SOUTH	06/01/2021 07:45:00	Breaker Equipment - Failed to Reclose	Breaker Equipment - Operating Mechanism	53,757	53,757
82,826	LAKE WALES	03/13/2021 15:39:10	Miscellaneous - Distribution System Equipment	Breaker Equipment - Close Coil	42,414	42,414
85,316	Lake Wales (LKWL) BK2 + 69kV Bus 2	06/29/2021 16:41:10	Miscellaneous - Distribution System Equipment	Relay and Control Systems - Relay Failure/Misoperation	305,395	305,395
81,992	ALACHUA	01/19/2021 09:18:00	Breaker Equipment - Bushings (Breaker)	Breaker Equipment - Bushings (Breaker)	6,046	6,046
83,454	CURLEW*	03/23/2021 10:47:00	Line Equipment - Conductor (Line)	Breaker Equipment - Close Coil	94,024	94,024
83,772	MONTVERDE	05/15/2021 08:35:15	Animal - Squirrel	Breaker Equipment - Failed to Reclose	58,670	58,670
84,268	ORANGEWOOD	06/02/2021 23:21:17	Unknown - Unknown, after Completed Engineer Investigation	Breaker Equipment - Operating Mechanism	1,290	1,290
83,548	South Polk (SOPK) - South Fort Meade (SFMD) 115kV Line	04/18/2021 21:35:24	O&M (Planned or Scheduled) - Customer Request	O&M (Planned or Scheduled) - Customer Request	0	3
82,018	MONTVERDE	02/03/2021 07:08:26	Human Error - Incorrect Relay Setting	Human Error - Incorrect Relay Setting	1,369,540	1,369,540
83,898	Reddick (RDDK) - Williston (WLST) 69kV Line	05/22/2021 16:45:53	Line Equipment - Static Wire (OHGW)	Line Equipment - Static Wire (OHGW)	49,504	59,434
84,014	Desoto City (DSOC) - Lake Placid North (LKPN) 69kV Line	05/31/2021 11:26:12	Animal - Bird Nest	Line Equipment - Crossarm	1,576	3,152
84,024	Peacock (PCOK) - 5584 Mosaic Feeder 69kV (PCMX Line)	05/30/2021 14:16:00	O&M (Planned or Scheduled) - Preventive Maintenance Activity	O&M (Planned or Scheduled) - Preventive Maintenance Activity	0	45
84,078	SAND LAKE*	06/02/2021 08:44:20	Human Error - Construction (PD Contractor)	Human Error - Construction (PD Contractor)	8,939	8,939
84,558	Fort White (FWHT) - Suwannee Transmission (SWTR) 115kV Line	06/09/2021 16:36:13	Lightning - Lightning,Correlated in lightning detection systm)	Line Equipment - Crossarm	0	5,215
84,710	EATONVILLE*	06/14/2021 23:10:09	Weather/Environment - Lightning Suspected, yet not correlated	Line Equipment - Static Wire (OHGW)	955,673	955,673
84,962	Havana (HVNA) 69kV Bus 1	06/19/2021 21:58:34	Animal - Snake	Other - No Reclose by Design or Policy	0	193,603
85,076	Frostproof (FSPF) - Lake Wales (LKWL) 69kV Line	06/22/2021 18:46:01	Lightning - Lightning,Correlated in lightning detection systm)	Line Equipment - Conductor (Line)	19,239	19,239
85,164	Fisheating Creek (FISH) - Sun N Lakes (SUNL) 69kV Line	06/25/2021 14:17:58	Lightning - Lightning,Correlated in lightning detection systm)	Other - No Reclose by Design or Policy	7,194	14,388
85,166	North Bartow (NBTW) - West Lake Wales (WLWL) 69kV Line	06/25/2021 12:17:48	Animal - Bird	Relay and Control Systems - Recloser	0	2
81,994	Havana (HVNA) - Tallahassee (TALL) 69kV Line	02/01/2021 15:53:00	Line Equipment - Static Wire (OHGW)	Line Equipment - Static Wire (OHGW)	2,910	2,910
85,264	Eustis South (EUSS) - Tavares (TVRS) 69kV Line	06/15/2021 08:49:00	Switch Equipment/Malfunction - Operating Mechanism	Switch Equipment/Malfunction - Operating Mechanism	0	35,556
85,348	TRENTON*	06/29/2021 19:30:00	Miscellaneous - Distribution System Equipment	Breaker Equipment - Failed to Reclose	6,790	6,790
85,376	BAY HILL*	06/30/2021 09:23:21	Animal - Squirrel	Animal - Squirrel	135,050	135,050
81,680	Fort Green 6 (FGN6) - F6MX Mosaic Feeder 25kV (F6MX Line)	01/06/2021 17:53:13	Breaker Equipment - Close Coil	Breaker Equipment - Close Coil	0	902
86,508	MEADOW WOODS EAST	08/02/2021 14:21:48	Miscellaneous - Distribution System Equipment	Breaker Equipment - Failed to Reclose	101,805	101,805
82,066	Circle Square (CSQR) - Ross Prairie (ROSS) 69kV Line	02/04/2021 06:42:13	Load Related - Cold Load Pickup	Load Related - Cold Load Pickup	0	61,630
86,690	TAFT	08/06/2021 08:36:40	Miscellaneous - Distribution System Equipment	Relay and Control Systems - Recloser	11,700	11,700
86,726	Eustis South (EUSS) - Sorrento (SNTO) 69kV Line	08/11/2021 12:11:01	Weather/Environment - Rain (Includes Fog,Mist,Drizzle)	Line Equipment - Conductor (Line)	0	164,997
82,132	Narcoossee (NARC) BK3 + 69kV Bus 3	02/07/2021 12:38:41	Transformer Equipment - Bushing (Transformer)	Breaker Equipment - Physical Connection/Hardware (Breaker)	191,125	191,125
82,336	BELLEAIR*	02/14/2021 01:16:00	Breaker Equipment - Close Coil	Breaker Equipment - Close Coil	253,645	253,645
82,372	MAITLAND	02/11/2021 07:35:15	Breaker Equipment - Electrical Controls/Circuitry	Breaker Equipment - Interrupters	71,310	71,310
86,648	CONWAY*	08/07/2021 17:08:29	Lightning - Lightning,Correlated in lightning detection systm)	Line Equipment - Static Wire (OHGW)	225,333	225,333
83,040	Disston (DISS) BK1	04/01/2021 12:51:24	Transformer Equipment - Tap Changer (Manual)	Transformer Equipment - Tap Changer (Manual)	844,875	844,875
85,690	South Fort Meade (SFMD) BK4	07/09/2021 17:41:47	Customer / Other Util Equip Problems - Customer's Line Equipment (Non-Duke)	Unknown - Unknown, after Completed Engineer Investigation	0	956
85,830	FLORA-MAR*	07/12/2021 16:02:00	Weather/Environment - Lightning Suspected, yet not correlated	Transformer Equipment - Other Aux Equipment (Controls, alarms, etc.)	903,363	903,363
85,998	PORT RICHEY WEST*	07/16/2021 10:31:00	Human Error - Incorrect Wiring	Human Error - Incorrect Wiring	370	370
83,398	Zephyrhills North (ZPHN) - (TECO) Dade City (DADE) 69kV Line	04/22/2021 08:10:29	Human Error - Duke Switching Error	Human Error - Duke Switching Error	0	8,435
82,852	SILVER SPRINGS SHORES	03/19/2021 01:08:17	Breaker Equipment - Operating Mechanism	Breaker Equipment - Operating Mechanism	67,319	67,319
82,382	Crystal River (CRPL) BK10	02/17/2021 07:39:42	Human Error - Maintenance Personnel (Generation)	Breaker Equipment - Interrupters	956	956
83,314	SANTOS	04/06/2021 11:59:00	Miscellaneous - Distribution System Equipment	Breaker Equipment - Operating Mechanism	11,022	11,022
83,698	Reddick (RDDK) - Williston (WLST) 69kV Line	05/11/2021 14:54:52	Animal - Bird Nest	Animal - Bird Nest	42,532	68,653
86,852	Crystal River South (CRSO) - Twin County Ranch (TWCO) 115kV Line	08/13/2021 23:08:02	Line Equipment - Insulator (Line, Porcelain)	Line Equipment - Insulator (Line, Porcelain)	0	932,365
83,482	Lake Wales (LKWL) - Citrusville (CITV) 69kV Line	04/28/2021 08:21:49	Animal - Bird Nest	Other - No Reclose by Design or Policy	0	80
87,186	LARGO*	08/13/2021 16:27:17	Lightning - Lightning,Correlated in lightning detection systm)	Line Equipment - Static Wire (OHGW)	171,246	171,246
87,218	ARBUCKLE CREEK	08/23/2021 05:34:42	Relay and Control Systems - Relay Failure/Misoperation	Relay and Control Systems - Relay Failure/Misoperation	56,967	56,967
87,372	Dunnellon (DNLN) BK1 Load	08/28/2021 12:25:53	Transformer Equipment - Arrestor (Transformer)	Transformer Equipment - Arrestor (Transformer)	84,080	84,080
87,432	Idylwild (IDYW) - Williston (WLST) 69kV Line	09/01/2021 14:35:05	Human Error - Duke Switching Error	Human Error - Duke Switching Error	0	14,117
87,672	APALACHICOLA*	08/24/2021 07:31:57	Transformer Equipment - Regulator	Transformer Equipment - Regulator	92	92
87,786	Fisheating Creek (FISH) - Sun N Lakes (SUNL) 69kV Line	09/17/2021 08:00:22	Animal - Other Animal	Animal - Other Animal	0	213,280

87,788	Winter Park East (WPKE) BK3	09/13/2021 21:17:14	Animal - Raccoon	Animal - Raccoon	360,716	360,716
87,614	Okahumpka (OKHP) - Lake County Resource Recovery (LCRR) 69kV Line	09/08/2021 17:55:31	Lightning - Lightning,Correlated in lightning detection systm)	Line Equipment - Static Wire (OHGW)	192,262	192,262
87,670	ZEPHYRHILLS*	09/11/2021 08:04:00	Animal - Squirrel	Animal - Squirrel	572,323	572,323
87,420	Fort White (FWHT) - Suwannee Transmission (SWTR) 115kV Line	09/01/2021 05:58:08	Line Equipment - Crossarm	Line Equipment - Crossarm	0	19,997
87,634	Bronson (BRSN) - Crystal River (CRPL) 230kV Line	09/10/2021 01:55:11	Relay and Control Systems - Relay Failure/Misoperation	Relay and Control Systems - Relay Failure/Misoperation	44,352	321,691
87,698	BAY HILL*	09/09/2021 12:31:04	Miscellaneous - Distribution System Equipment	Breaker Equipment - Electrical Controls/Circuitry	13,910	13,910
87,886	ARCHER	09/21/2021 14:38:00	Lightning - Lightning,Correlated in lightning detection systm)	O&M (Planned or Scheduled) - Work on Damaged Equipment	709	709
87,206	DINNER LAKE	08/22/2021 08:20:50	Animal - Bird	Breaker Equipment - Bushings (Breaker)	328,927	328,927
89,560	WEWAHOOTEE*	12/12/2021 19:13:46	Transformer Equipment - Regulator	Transformer Equipment - Regulator	523	523
88,640	Fort White (FWHT) - Jasper South (JASS) 69kV Line	11/02/2021 10:31:38	Human Error - Maintenance Personnel (R/W Contractor)	Line Equipment - Conductor (Line)	0	108,423
88,172	WINTER PARK EAST	09/26/2021 05:44:50	Relay and Control Systems - Relay Failure/Misoperation	Relay and Control Systems - Relay Failure/Misoperation	55,122	55,122
89,028	Avon Park (AVPK) - Wauchula (WACH) 69kV Line	12/04/2021 04:51:37	Public Interference - Vehicle	O&M (Planned or Scheduled) - Work on Damaged Equipment	0	191,160
89,370	Parkway (PKWY) - Taft (TAFT) 69kV Line	12/27/2021 10:51:02	Line Equipment - Crossarm	Line Equipment - Crossarm	0	2
88,526	Archer (ARCH) - Williston (WLST) 69kV Line	10/26/2021 11:07:21	Human Error - Maintenance Personnel (R/W Contractor)	Human Error - Maintenance Personnel (R/W Contractor)	0	56,250
88,908	Eustis South (EUSS) - Sorrento (SNTO) 69kV Line	11/23/2021 22:59:20	Line Equipment - Conductor (Line)	Line Equipment - Conductor (Line)	0	229,752
89,074	Desoto City (DSOC) - Lake Placid North (LKPN) 69kV Line	12/08/2021 08:59:44	Animal - Bird Nest	Animal - Bird Nest	8,659	32,183
88,302	Winter Garden (WGDN) BK2	10/11/2021 14:12:21	Relay and Control Systems - Relay Failure/Misoperation	Human Error - Construction (PD Contractor)	4,212	4,212
88,996	BOGGY MARSH	11/27/2021 08:07:29	Animal - Squirrel	Animal - Squirrel	182,346	182,346
88,424	GROVELAND*	07/08/2021 11:53:28	Breaker Equipment - Physical Connection/Hardware (Breaker)	Breaker Equipment - Physical Connection/Hardware (Breaker)	12,549	12,549
88,040	Plymouth South (PLYS) - Zellwood (ZLWD) 69kV Line	09/30/2021 11:19:46	Contact - Human (Duke Contractor)	Contact - Human (Duke Contractor)	414	414
88,248	MAGNOLIA RANCH	10/06/2021 22:25:00	Miscellaneous - Distribution System Equipment	Breaker Equipment - Physical Connection/Hardware (Breaker)	109,560	109,560
88,346	INVERNESS	10/13/2021 13:09:00	Human Error - Construction (PD Contractor)	Human Error - Construction (PD Contractor)	39,046	39,046

ATTACHMENT B

DEF TRANSMISSION Outages-Major Events Only

OUTAGE_ID	LOCATION	OUTAGE_START_TIME	INITIATING_CAUSE	SUSTAINED_CAUSE
86,966	Apalachicola (APAL) - Carrabelle (CRBL) 69kV Line	08/17/2021 06:13:59	Transformer Equipment - Arrestor (Transformer)	Weather/Environment - Hurricane
86,308	EAST CLEARWATER*	04/11/2021 08:42:00	Animal - Squirrel	Animal - Squirrel

ATTACHMENT C & C1

DUKE ENERGY.

Exclusion Summary - 2021

2021

a. Include in the discussion, the type of weather event, strength (wind speeds/surge-flood levels), locations affected, source of meteorological information, and the performance of overhead and underground systems.

Dates	Type of Weather Event	Strength (Wind Speeds/surge-flood levels)	Locations affected	Source of Metrological Information	Performance of Overhead and Underground Systems
2/14/2021 - 1:00 AM to 4:59 AM	Tornado	Unknown Wind Speed	Clearwater	National Weather Service	See response to
			Walsingham		Section (d) - pg. 10 of
					Reliability Report
7/5/2021 12:00 PM to 7/8/2021 3:59 PM	Tropical Storm Elsa	39 to 73 mph	Clearwater	National Weather Service	See response to
			Inverness		Section (d) - pg. 10 of
			Monticello		Reliability Report
			Ocala		
			Seven Springs		
			St. Petersburg		
			Walsingham		
			Zephyrhills		
8/10/2021 - 6:00 PM to 6:59 PM	Tornado	Unknown Wind Speed	Seven Springs	National Weather Service	See response to
					Section (d) - pg. 10 of
					Reliability Report
8/15/2021 12:00 AM to 8/17/2021 11:59 PM	Tropical Storm Fred	39 to 73 mph	Monticello	National Weather Service	See response to
					Section (d) - pg. 10 of
					Reliability Report
9/8/2021 5:00 PM to 9/9/2021 4:59 PM	Tropical Storm Mindy	39 to 73 mph	Monticello	National Weather Service	See response to
			Ocala		Section (d) - pg. 10 of
					Reliability Report

b. Describe the Company's efforts to avoid or minimize in terms of costs incurred and outage duration any similar events in the future.
(Example: Reference specific storm hardening activity.)

b. Please see response to Storm Hardening Facilities (I).

c. If the method of deriving the weather exclusion is different from the method used for 2020, please explain the changes and provide the CMI and CI for 2021 using the prior method.

c. The exclusion method used is the same since 2005.

d. (Appendix) Provide the 2021 service reliability data for each extreme weather outage event that is excluded from your Company's 2021 Annua Distribution Reliability Report pursuant to Rule 25-6.0455.

i. A Table
ii. Electronic File
iii. Overhead and Underground statistics & forensics. (C, CMI, CI, L-Bar, repair cost, etc.)

Dates	Overhead vs. Underground	C	CMI	CI	Duration	L-Bar	N
2/14/2021 - 1:00 AM to 4:59 AM	OH	301,187	419,149	4,316	3,809	272.1	14
	UG		13,407	89	620	206.7	3
7/5/2021 12:00 PM to 7/8/2021 3:59 PM	OH	929,226	3,991,613	30,598	145,258	218.8	664
	UG		260,414	1,181	23,072	240.3	96
8/10/2021 - 6:00 PM to 6:59 PM	OH	198,491	16,033	165	1,437	159.6	9
	UG		15,521	61	1,130	376.7	3
8/15/2021 12:00 AM to 8/17/2021 11:59 PM	OH	57,422	4,348,192	14,878	45,155	291.3	155
	UG		167,146	142	2,666	533.2	5
9/8/2021 5:00 PM to 9/9/2021 4:59 PM	OH	141,660	1,105,689	6,354	23,702	257.6	92
	UG		2,954	11	2,161	270.2	8

Distribution
Exclusion Summary - 2021

Cause Code Types		C	CMI	CI	Duration	L-Bar	N
Reported Actual Data		1,902,535	181,617,046	2,181,141	6,695,335	141.1	47,466
Exclusions:							
Severe Weather (Distribution)	(Tornados & Named Storms)		7,431,114	48,219	240,696	244.9	983
Distribution (Non Severe Weather)			-	-	-	-	-
Transmission (Severe Weather)			2,635,616	2,444	2,423	1,211.5	2
Transmission (Non Severe Weather)			10,399,161	152,508	13,975	100.5	139
Emergency Shutdowns (Severe Weather)	(DEF/Govt/Customer Decisions)		261,040	7,005	4,486	89.7	50
Emergency Shutdowns (Non Severe Weather	(DEF/Govt/Customer Decisions)		10,512,659	307,864	207,354	82.8	2,504
Prearranged (Severe Weather)			12,348	127	1,407	100.5	14
Prearranged (Non Severe Weather)			7,188,685	57,196	737,933	130.5	5,655
Adjusted Data		1,902,535	143,176,423	1,605,778	5,487,061	143.9	38,119

ATTACHMENT C2

Actual Data: Customer Minutes of Interruption (CMI), Customer Interruptions (CI) and Documented Exclusions

Year	Customer minutes of Interruption (CMI)		Customer Interruptions (CI)	
	Value	% of Actual	Value	% of Actual
Reported Actual Data	181,617,046	100%	2,181,141	100%
Documented Exclusions				
Planned Service Interruptions	7,188,685	3.96%	57,196	2.62%
Named Storm	9,876,008	5.44%	53,164	2.44%
Tornadoes	464,110	0.26%	4,631	0.21%
Ice on Lines				
Planned Load Management Events				
Generation/Transmission Events	10,399,161	5.73%	152,508	6.99%
Extreme Weather (EOC Activation/Fire)				
Reported Adjusted Data	143,176,423	78.83%	1,605,778	73.62%

ATTACHMENT D

CAUSES OF OUTAGE EVENTS – ADJUSTED

Utility Name: Duke Energy Florida Years: **2017 to 2021**

	2021			2020			2019			2018			2017		
Cause (a)	Number of Outage Events(N) (b)	Average Duration (L-Bar) (c)	Average Restoration Time (CAIDI) (d)	Number of Outage Events(N) (b)	Average Duration (L-Bar) (c)	Average Restoration Time (CAIDI) (d)	Number of Outage Events(N) (b)	Average Duration (L-Bar) (c)	Average Restoration Time (CAIDI) (d)	Number of Outage Events(N) (b)	Average Duration (L-Bar) (c)	Average Restoration Time (CAIDI) (d)	Number of Outage Events(N) (b)	Average Duration (L-Bar) (c)	Average Restoration Time (CAIDI) (d)
1. Animals	5,347	80.6	69.5	3,882	82.1	68.8	5,127	82.0	67.3	4,566	81.6	69.1	5,596	80.0	63.9
2. Vegetation	7,790	153.9	107.9	9,291	160.3	110.9	8,883	159.6	108.1	8,522	148.3	106.6	8,143	150.1	102.8
3. Lightning	1,126	151.4	109.7	994	157.0	97.4	943	168.3	106.0	1,517	157.4	103.2	1,261	151.4	80.2
4. Other Weather	4,060	140.2	103.9	5,826	159.3	109.7	5,658	153.1	105.2	6,463	143.5	110.8	5,478	145.2	95.4
5. Vehicle	460	241.4	96.8	509	245.1	111.6	445	249.9	119.2	599	232.7	105.2	505	223.2	103.2
6. Defective Equipment	11,449	146.1	82.6	11,973	146.4	82.4	11,921	145.8	87.0	12,038	151.8	97.3	10,475	150.0	91.0
7. Unknown	688	95.3	52.0	556	87.7	69.0	859	84.5	54.5	766	83.2	58.7	998	93.9	64.5
All Other Causes	7,199	176.3	74.7	7,170	181.0	71.4	8,223	169.0	75.7	8,310	173.0	82.6	8,287	179.8	76.1
System Totals:	38,119	143.9	89.2	40,201	152.1	93.5	42,059	146.8	93.1	42,781	146.6	97.3	40,743	145.4	89.5

ATTACHMENT E

DUKE ENERGY.

2022 PROGRAM BUDGET

CAPITAL													
	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22	Annual
956 - DEF Fuse Replacement	1,459,384	1,911,016	2,850,665	2,609,582	2,741,179	2,830,796	2,666,395	2,371,071	1,900,353	1,738,729	1,718,959	1,454,052	26,252,181
ATS - ATS Replace	0	98,974	97,531	0	98,130	98,350	0	99,159	0	0	0	0	492,143
CBLDT - UG Cable Repl DT	152,655	150,161	147,236	147,339	148,248	297,016	148,786	150,479	151,417	150,921	150,021	152,490	1,946,769
CMCDT - Corr Maint Cap DT	178,447	175,039	170,888	170,879	172,171	86,350	43,273	0	0	0	0	0	997,047
CMCEDT - Corr Maint Cap Emerg DT	0	0	0	0	36,860	0	0	0	0	0	0	0	36,860
CMCEOH - Corr Maint Cap Emerg OH	100,480	115,543	117,655	117,755	126,544	118,662	110,534	119,896	78,985	62,167	57,745	50,133	1,176,098
CMCEUG - Corr Maint Cap Emerg UG	30,631	77,559	135,404	139,760	140,554	145,181	183,713	168,383	95,543	60,603	43,066	39,296	1,259,692
CMCOH - OH Replace (Other - Planned)	0	0	3,118	21,845	50,180	28,290	34,587	0	0	0	0	0	138,021
CMCOWP - Corr Maint Cap OH Wire Pri	0	1,193	1,169	1,169	1,177	1,139	775	701	664	579	616	544	9,728
CMCOWS - Corr Maint Cap OH Wire Sec Svc	9,708	9,834	9,835	9,716	9,982	9,969	9,903	10,102	10,083	10,011	5,833	4,147	109,121
CMCUG - Corr Maint Cap UG Oth	15,819	109,161	107,328	138,089	138,821	139,145	123,770	93,739	62,832	78,311	62,336	15,797	1,085,147
CTP1PH - Cst Trnf Pdmt Repl 1PH Leak	0	0	10,273	41,110	51,727	41,497	41,553	10,513	10,582	0	0	0	207,256
CTP3PH - Cst Trnf Pdmt Repl 3PH Leak	0	0	0	89,806	67,700	67,860	0	0	0	0	0	0	225,366
CTR1PH - Cst Trnf Pdmt Repl 1PH Dry	38,680	40,083	48,748	48,765	77,168	53,702	53,382	38,108	38,350	41,335	40,010	39,401	557,733
CTR3PH - Cst Trnf Pdmt Repl 3PH Dry	24,775	25,673	26,431	96,079	77,751	24,729	24,529	24,408	24,564	26,476	25,627	25,237	426,279
DAIDR - Distribution Automation Rplc	0	21,254	0	21,026	0	21,152	0	21,291	0	21,319	0	0	106,042
DLS - OH Line Switch Repl	49,822	49,069	48,195	36,177	36,381	36,472	36,493	24,583	12,363	0	0	0	329,556
ELT3PH - End of Life Trans 3PH	4,664	4,831	4,971	4,972	4,762	4,652	4,614	4,593	4,623	4,983	4,822	4,751	57,240
GENSWGR - Switchgear Replacement	225,231	278,060	274,307	247,284	275,922	248,859	248,658	194,989	167,944	55,797	83,498	0	2,300,549
GNSWLF - Livefront Switchgear Replaceme	11,657	12,078	12,433	12,435	11,909	11,633	11,539	11,483	11,557	12,456	12,056	11,874	143,111
HYDR - Recloser Repl Hydraulic	89,395	110,601	124,228	90,595	119,663	156,361	88,011	88,267	88,761	115,493	107,178	48,460	1,227,013
MHR - Manhole Lid Retrofit	0	0	188,054	300,812	246,351	0	0	0	0	0	0	0	735,217
NANC - NAN Replacements	19,654	29,142	19,192	19,229	19,302	14,505	19,316	29,192	4,888	14,614	0	0	189,033
POLCM - Pole Replacement Reactive	696,347	893,297	984,303	1,118,506	737,556	771,480	796,640	475,867	430,332	938,835	506,156	434,649	8,783,967
POLIR - Pole Replace Insp FUP	1,223,898	1,241,657	1,252,879	1,228,990	931,812	910,500	903,291	899,922	906,198	976,471	944,450	932,074	12,352,142
POLOTH - Pole Insp FUP Other Prop Units	10,112	8,699	14,612	8,528	12,262	13,525	11,079	9,963	12,534	9,994	6,207	3,791	121,306
POLOVL - Pole Replace Overloaded Pole	52,535	94,630	109,461	75,812	110,245	76,541	85,170	43,109	60,753	43,253	42,949	43,800	838,258
POLRNF - Pole Reinforcement	20,000	24,336	23,731	22,407	22,585	21,990	19,376	19,651	19,797	19,734	12,809	12,464	238,881
PTR1PH - Pro Trnf Pdmt Repl 1PH Dry	138,749	143,709	147,854	176,324	160,699	138,375	137,259	136,636	137,531	148,223	143,439	141,346	1,750,145
PTR3PH - Pro Trnf Pdmt Repl 3PH Dry	23,321	24,156	24,854	42,236	41,253	40,740	23,072	22,967	23,117	24,914	24,111	23,754	338,495
RCR - Capacitor Replacement	575,712	585,611	585,729	616,574	610,759	616,420	616,099	608,411	397,465	378,749	130,221	104,894	5,826,644
RGR - Regulator Replacement	11,608	11,474	68,021	56,801	45,610	114,257	34,228	80,461	57,734	69,043	11,493	0	560,731
RIR - Inf Scan Insp Replace FUP	9,896	4,876	9,588	4,799	4,825	4,837	4,838	4,886	0	0	0	0	48,544
RNET - Network Sec Main Replace	208,150	204,575	200,334	200,435	201,754	202,402	202,584	205,023	206,362	205,686	204,304	208,150	2,449,759
RRR - Recloser Electronic Replace	216,347	364,970	233,234	314,870	361,865	410,019	245,623	180,835	132,135	285,555	200,512	233,011	3,178,977
RSC - OH Stolen Conductor Replace	551	582	576	576	599	591	591	593	596	589	351	243	6,437
RTP1PH - Pad Transf 1PH Oil Leak Rplc	0	10,598	93,273	331,726	313,175	345,499	314,636	116,836	21,388	31,978	0	10,806	1,589,916
RTP3PH - Pad Transf 3PH Oil Leak Rplc	0	30,534	330,689	571,982	605,012	576,096	575,928	581,259	461,332	214,572	30,547	92,424	4,070,375
RTR1PH - Pad Transf 1PH Non Leak Rplc	75,945	184,718	181,773	167,238	163,134	143,697	89,188	80,031	70,405	35,088	14,979	0	1,206,197
RTR3PH - Pad Transf 3PH Non Leak Rplc	0	334,151	569,776	300,442	241,317	90,683	60,387	60,863	30,576	0	0	0	1,688,194
RTXLF - Transf OH Livefront Repl	921	11,252	11,100	26,301	36,583	11,128	6,018	907	913	984	953	938	107,998
RTXO - Transf OH Repl	0	23,047	58,874	86,131	104,839	82,253	59,429	13,856	0	0	0	0	428,428
RUCLG - UG Lg Cable Pri only Replace	240,158	255,561	254,172	256,056	286,594	289,603	286,130	325,367	150,586	26,443	36,563	23,884	2,431,117
RUCSEC - UG Cable Repl Sec Svc	1,345,970	1,108,263	1,126,665	813,285	969,572	1,127,668	1,279,367	1,357,257	1,518,399	1,678,982	1,488,665	1,373,525	15,187,619
RUCSM - UG Sm Cable Pri only Replace	1,567,565	2,088,971	2,112,680	2,495,856	2,877,620	3,558,551	1,285,412	1,162,003	1,013,776	1,757,933	1,429,316	1,510,700	22,860,384
SPPPLFD - SPP Pole Repl Feeder Hardening	25,046	24,549	1,656,548	1,664,521	1,684,166	1,696,912	1,723,508	1,722,106	1,710,142	1,696,720	346,831	322,558	14,273,608
SPPPLHD - SPP Pole Repl Lateral Hardenin	70,459	69,061	4,488,947	4,512,792	4,545,026	4,566,212	4,621,638	4,681,399	4,705,758	4,682,704	1,413,682	1,839,627	40,197,304
TRTXO - TX Repl Proactive OH	482,756	499,481	513,200	513,270	491,838	480,583	476,768	474,961	478,260	515,352	498,478	491,869	5,916,816
VNPTRR - Vault Netwk Prot & Transf Rplc	0	0	0	93,465	93,823	94,014	0	0	0	0	94,582	0	375,884
ARRETRO - ARRESTOR STATION RETROFIT	329,769	341,601	351,518	351,569	336,727	328,958	326,297	324,785	326,896	352,316	340,969	335,921	4,047,326
AVIAN - Avian Protection Cap	20,369	10,037	19,739	0	0	0	0	0	0	0	0	0	50,145
DPZ - Declared Protection Zone	32,215	33,357	34,308	34,312	32,869	32,113	31,855	31,717	31,927	34,408	33,293	32,821	395,196
RFS - Circuit Sectionalization	716	741	763	763	731	714	708	705	709	764	740	729	8,781
RIOTC - Outage Invest Improv Cap	729,966	1,358,300	1,293,419	942,058	737,301	720,081	711,296	709,749	694,626	672,905	474,856	266,240	9,310,798
ROC - OH Deteriorated Conductor Rplc	6,715	6,956	7,157	7,158	6,856	6,698	6,644	6,613	6,657	7,174	6,943	6,840	82,411
RPR - Riser Pole Retrofit Cap	853,188	882,651	906,758	906,874	869,047	849,174	842,455	839,331	845,194	910,732	880,853	869,348	10,455,605
516 - DEF Targeted OH/UG Conversion	(218,478)	302	302	302	302	302	302	302	302	302	302	302	(215,154)
CON - OH to UG Conversion Cap	369,926	430,140	501,720	491,027	438,751	412,565	389,468	372,766	370,227	449,292	406,979	351,376	4,984,238
HWYN - Highway Nonreimb Cap	1,109,814	1,290,447	1,505,175	1,473,100	1,316,277	1,237,721	1,168,426	1,118,325	1,110,713	1,347,908	1,220,967	1,054,153	14,953,025

DMAJDL - Major Reliability D Line Cap	1,552,292	1,795,212	2,074,408	2,025,314	1,815,090	1,707,841	1,618,405	1,556,054	1,548,140	1,880,388	1,691,336	1,493,203	20,757,683
DCAPINC - CAPACITY INCREASE - DIST STA	1,685,753	1,944,386	2,296,035	2,269,435	2,013,787	1,886,607	1,825,630	1,743,628	1,714,330	2,057,457	1,883,891	1,653,557	22,974,494
SPPCRCN - SPP Capacity and Connectivity	1,754,061	2,019,918	2,325,978	2,272,553	2,041,740	1,924,086	1,825,381	1,757,429	1,749,136	2,113,567	1,906,343	1,687,494	23,377,686
SPPFDHD - SPP Feeder Hardening	6,773,954	7,782,769	8,937,362	8,730,849	7,854,024	7,405,745	7,032,103	6,778,925	6,750,171	8,145,462	7,343,998	6,528,727	90,064,088
SPPFLMT - SPP UG Flood Mitigation	40,263	46,596	53,889	52,613	47,139	44,348	42,023	40,385	40,169	48,796	43,902	38,729	538,850
SPPLTOH - SPP Lateral Hardening Overhead	4,482,379	5,111,410	5,832,396	5,703,341	5,154,438	4,873,884	4,639,574	4,482,875	4,466,020	5,339,367	4,836,666	4,327,853	59,250,203
SPPLTUG - SPP Lateral Hardening Undrgrnd	6,637,596	7,624,461	8,753,158	8,550,633	7,692,885	7,254,188	6,888,967	6,641,756	6,613,846	7,980,015	7,194,343	6,399,013	88,230,861
SPPSGAU - SPP Segmentation and Automatn	3,647,907	4,198,619	4,844,994	4,740,792	4,262,224	4,020,658	3,812,954	3,665,451	3,644,819	4,381,922	3,975,724	3,494,618	48,690,684
SCDL - Sys Capacity D Line	965,167	1,110,448	1,277,512	1,248,199	1,122,476	1,058,353	1,004,847	967,504	962,742	1,161,305	1,048,419	929,724	12,856,696
Sum:	40,180,623	47,450,381	60,467,122	59,865,243	56,049,666	54,584,931	49,875,424	47,764,423	46,086,223	53,019,678	43,183,891	39,121,338	597,648,942
					O&M								
	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22	Annual
ENVREM - Other Environ Remediation	53,993	53,993	53,993	53,993	53,993	53,993	54,022	53,993	53,993	53,993	53,993	54,022	647,973
OHTXSPL - OH Transformer Oil Spill	8,750	8,750	8,750	8,750	8,750	8,750	8,750	8,750	8,750	8,750	8,750	8,750	105,000
PDSPL1 - Pdmt Single Phase Spill	130,416	130,416	130,416	130,416	130,416	130,416	130,876	130,416	130,416	130,416	130,416	130,876	1,565,909
PDSPL3 - Pdmt Three Phase Spill	32,637	32,637	32,637	32,637	32,637	32,637	35,791	32,637	32,637	32,637	32,637	35,791	397,955
AVOM - Avian Protection OM	2,241	2,241	2,241	2,241	2,241	2,241	2,499	2,241	2,241	2,241	2,241	2,499	27,403
CBLTST - UG Cable Testing OM	87,918	87,918	87,918	87,918	87,918	87,918	93,948	87,918	87,918	87,918	87,918	93,948	1,067,072
CCEMTU - Critical Environ Maint UG	4,172	4,172	4,172	4,172	4,172	4,172	5,300	4,172	4,172	4,172	4,172	5,300	52,324
CEINSU - Critical Environ Inspect UG	7,528	7,528	7,528	7,528	7,528	7,528	8,652	7,528	7,528	7,528	7,528	8,652	92,582
CMPUG - Padmount Equipment Painting	12,539	12,539	12,539	12,539	12,539	12,539	12,539	12,539	12,539	12,539	12,539	12,539	150,468
PADINS - SMEI Inspection	26,281	26,281	26,281	26,281	26,281	26,281	26,403	26,281	26,281	26,281	26,281	26,403	315,620
POLMT - Pole Inspection Repair FUP	187,244	187,244	187,244	187,244	187,244	187,244	191,815	187,244	187,244	187,244	187,244	191,815	2,256,075
POLOV - Pole Repair Overloaded Pole	9,132	9,132	9,132	9,132	9,132	9,132	9,507	9,132	9,132	9,132	9,132	9,507	110,332
RIOUT - Outage Invest Improv	381,274	381,274	381,274	381,274	381,274	381,274	420,656	381,274	381,274	381,274	381,274	420,656	4,654,047
SPCCINS - SPCC Inspection	917	917	917	917	917	917	962	917	917	917	917	962	11,092
SPCCOM - SPCC Inspection Repair FUP	248	248	248	248	248	248	259	248	248	248	248	259	2,999
SWGINS - Switchgear UG Insp	27,734	27,734	27,734	27,734	27,734	27,734	40,007	27,734	27,734	27,734	27,734	40,007	357,353
VAULTI - Vault Inspection	14,453	14,453	14,453	14,453	14,453	14,453	17,044	14,453	14,453	14,453	14,453	17,044	178,619
DPRJOMM - OM on Maintain Capital	317,331	317,331	317,331	317,331	317,331	317,331	330,184	317,331	317,331	317,331	317,331	330,184	3,833,676
PQINSE - PQ Cust Engin Inspect OM	106,299	119,568	134,674	125,208	118,334	127,977	149,392	143,271	132,366	142,274	129,566	112,536	1,541,463
DPRJOMH - OM on Highway-Mods	90,262	89,742	88,864	89,161	89,312	89,355	92,624	89,602	89,912	89,869	89,222	92,937	1,080,862
DPRJOMS - OM on Capacity Capital	229,512	228,193	225,964	226,717	227,102	227,210	236,510	227,838	228,625	228,514	226,872	237,307	2,750,361
SPPFDHD - SPP Feeder Hardening	34,532	45,772	56,646	56,838	45,549	39,875	34,070	34,275	34,396	51,568	45,502	34,188	513,210
SPPISFD - SPP Pole Insp Feeder Hardening	77,258	76,805	76,040	76,308	76,468	76,505	83,486	112,366	116,123	127,397	56,455	0	955,210
SPPISHD - SPP Pole Insp Lateral Hardenin	216,908	215,636	213,488	214,240	214,690	214,794	234,392	315,477	326,025	357,677	158,503	0	2,681,829
SPPLTOH - SPP Lateral Hardening Overhead	18,492	24,512	30,335	30,438	24,392	21,354	18,245	18,354	18,419	27,615	24,367	18,308	274,831
SPPSGAU - SPP Segmentation and Automatn	118,041	156,465	193,632	194,290	155,702	136,305	116,462	117,162	117,575	176,276	155,541	116,866	1,754,317
Sum:	2,196,111	2,261,500	2,324,449	2,318,006	2,256,356	2,238,181	2,354,392	2,363,153	2,368,248	2,505,995	2,190,836	2,001,354	27,378,581
Totals:	42,376,733	49,711,881	62,791,571	62,183,248	58,306,022	56,823,113	52,229,816	50,127,576	48,454,471	55,525,673	45,374,727	41,122,693	625,027,524

ATTACHMENT F

SYSTEM RELIABILITY INDICES – ADJUSTED

Utility Name: Duke Energy Florida Year: **2017 to 2021**

	2021					2020					2019					2018					2017				
District or Service Area (a)	SAIDI (b)	CAIDI (c)	SAIFI (d)	MAIFIe (e)	CEMI5 (f)	SAIDI (b)	CAIDI (c)	SAIFI (d)	MAIFIe (e)	CEMI5 (f)	SAIDI (b)	CAIDI (c)	SAIFI (d)	MAIFIe (e)	CEMI5 (f)	SAIDI (b)	CAIDI (c)	SAIFI (d)	MAIFIe (e)	CEMI5 (f)	SAIDI (b)	CAIDI (c)	SAIFI (d)	MAIFIe (e)	CEMI5 (f)
North Coastal Region*	90.0	1.0	94.56	5.4	1.10%	117.2	101.9	1.15	6.4	2.32%	169.5	108.5	1.56	9.7	5.50%	168.3	111.0	1.52	13.6	4.80%	154.3	106.6	1.45	8.2	2.83%
South Coastal Region*	67.8	0.8	84.29	3.7	0.15%	82.6	96.1	0.86	6.0	0.37%	72.0	83.8	0.86	7.9	0.19%	95.2	99.8	0.95	10.8	0.49%	75.0	85.1	0.88	6.8	0.21%
North Central Region	81.0	0.8	97.61	5.2	0.64%	85.2	101.5	0.84	6.8	0.42%	87.0	107.7	0.81	4.7	0.41%	86.4	90.4	0.96	3.6	0.42%	75.5	90.0	0.84	7.6	0.37%
South Central Region	65.2	0.8	81.36	4.4	0.28%	70.4	76.7	0.92	6.5	1.17%	85.9	84.6	1.02	8.8	0.79%	84.3	90.4	0.93	11.4	0.44%	69.6	83.3	0.84	6.9	0.87%
System Averages	75.3	0.8	89.16	4.6	0.52%	87.9	93.5	0.94	6.4	1.06%	90.5	93.1	0.97	7.6	1.02%	98.5	97.3	1.01	9.7	0.95%	82.7	89.5	0.92	7.2	0.73%

ATTACHMENT G

2021 Summer Feeder Peaks

Load Area	NAME	BANK	FEEDER NAME	PLANNER PEAK MVA
NORTH CENTRAL	ALAFAYA	2	W0289	10.3
NORTH CENTRAL	ALAFAYA	2	W0290	8.8
NORTH CENTRAL	ALAFAYA	3	W0297	9.6
NORTH CENTRAL	ALAFAYA	3	W0298	9.5
NORTH CENTRAL	ALTAMONTE	1	M0571	7.7
NORTH CENTRAL	ALTAMONTE	1	M0572	9.0
NORTH CENTRAL	ALTAMONTE	1	M0573	11.3
NORTH CENTRAL	ALTAMONTE	1	M0574	10.5
NORTH CENTRAL	ALTAMONTE	2	M0575	10.0
NORTH CENTRAL	ALTAMONTE	2	M0576	7.6
NORTH CENTRAL	ALTAMONTE	2	M0578	9.7
NORTH CENTRAL	ALTAMONTE	2	M0579	8.3
NORTH CENTRAL	APOPKA SOUTH	3	M0720	8.2
NORTH CENTRAL	APOPKA SOUTH	3	M0721	6.9
NORTH CENTRAL	APOPKA SOUTH	1	M0722	5.5
NORTH CENTRAL	APOPKA SOUTH	1	M0723	9.1
NORTH CENTRAL	APOPKA SOUTH	1	M0724	5.0
NORTH CENTRAL	APOPKA SOUTH	2	M0725	8.2
NORTH CENTRAL	APOPKA SOUTH	2	M0726	8.7
NORTH CENTRAL	APOPKA SOUTH	2	M0727	7.2
NORTH CENTRAL	BARBERVILLE	1	W0902	6.8
NORTH CENTRAL	BARBERVILLE	2	W0903	1.9
NORTH CENTRAL	BARBERVILLE	2	W0904	4.0
NORTH CENTRAL	BAY RIDGE	2	M0445	4.1
NORTH CENTRAL	BAY RIDGE	1	M0447	5.5
NORTH CENTRAL	BAY RIDGE	2	M0451	10.0
NORTH CENTRAL	BAY RIDGE	1	M0453	8.3
NORTH CENTRAL	BITHLO	1	W0951	14.0
NORTH CENTRAL	BITHLO	1	W0952	4.4
NORTH CENTRAL	BITHLO	1	W0953	11.3
NORTH CENTRAL	BITHLO	2	W0954	9.5
NORTH CENTRAL	BITHLO	2	W0955	9.8
NORTH CENTRAL	BITHLO	2	W0956	9.3
NORTH CENTRAL	CASSADAGA	3	W0515	7.5
NORTH CENTRAL	CASSADAGA	3	W0516	6.7
NORTH CENTRAL	CASSADAGA	3	W0517	4.7
NORTH CENTRAL	CASSADAGA	2	W0523	4.0
NORTH CENTRAL	CASSADAGA	2	W0524	7.8
NORTH CENTRAL	CASSELBERRY	1	W0017	6.1

NORTH CENTRAL	CASSELBERRY	1	W0018	4.3
NORTH CENTRAL	CASSELBERRY	1	W0019	8.0
NORTH CENTRAL	CASSELBERRY	1	W0020	8.0
NORTH CENTRAL	CASSELBERRY	2	W0021	4.5
NORTH CENTRAL	CASSELBERRY	2	W0022	9.1
NORTH CENTRAL	CASSELBERRY	2	W0025	5.2
NORTH CENTRAL	CASSELBERRY	2	W0026	9.8
NORTH CENTRAL	CASSELBERRY	3	W0027	10.2
NORTH CENTRAL	CASSELBERRY	3	W0028	5.1
NORTH CENTRAL	CASSELBERRY	3	W0029	5.0
NORTH CENTRAL	DELAND	1	W0803	8.2
NORTH CENTRAL	DELAND	1	W0804	5.6
NORTH CENTRAL	DELAND	1	W0805	6.4
NORTH CENTRAL	DELAND	2	W0806	7.0
NORTH CENTRAL	DELAND	2	W0807	8.0
NORTH CENTRAL	DELAND	2	W0808	7.3
NORTH CENTRAL	DELAND	2	W0809	9.7
NORTH CENTRAL	DELAND EAST	3	W1102	5.3
NORTH CENTRAL	DELAND EAST	3	W1103	9.4
NORTH CENTRAL	DELAND EAST	3	W1104	6.8
NORTH CENTRAL	DELAND EAST	2	W1105	5.5
NORTH CENTRAL	DELAND EAST	2	W1106	6.1
NORTH CENTRAL	DELAND EAST	2	W1107	9.9
NORTH CENTRAL	DELAND EAST	1	W1108	8.7
NORTH CENTRAL	DELAND EAST	1	W1109	4.7
NORTH CENTRAL	DELAND EAST	1	W1110	7.8
NORTH CENTRAL	DELEON SPRINGS	1	W0032	7.4
NORTH CENTRAL	DELEON SPRINGS	1	W0034	5.1
NORTH CENTRAL	DELTONA	3	W4550	5.6
NORTH CENTRAL	DELTONA	3	W4553	4.9
NORTH CENTRAL	DELTONA	1	W4555	6.7
NORTH CENTRAL	DELTONA	3	W4556	9.5
NORTH CENTRAL	DELTONA	2	W4558	7.3
NORTH CENTRAL	DELTONA	1	W4561	4.5
NORTH CENTRAL	DELTONA	3	W4562	8.4
NORTH CENTRAL	DELTONA	2	W4564	3.7
NORTH CENTRAL	DELTONA	2	W4565	6.6
NORTH CENTRAL	DELTONA	1	W4567	6.3
NORTH CENTRAL	DELTONA EAST	3	W0121	6.9
NORTH CENTRAL	DELTONA EAST	2	W0123	9.3
NORTH CENTRAL	DELTONA EAST	3	W0124	8.1
NORTH CENTRAL	DELTONA EAST	2	W0126	5.0
NORTH CENTRAL	DELTONA EAST	3	W0130	10.3
NORTH CENTRAL	DELTONA EAST	2	W0132	7.6

NORTH CENTRAL	DOUGLAS AVENUE	1	M1704	4.3
NORTH CENTRAL	DOUGLAS AVENUE	2	M1706	6.3
NORTH CENTRAL	DOUGLAS AVENUE	1	M1707	5.2
NORTH CENTRAL	DOUGLAS AVENUE	2	M1709	5.7
NORTH CENTRAL	DOUGLAS AVENUE	2	M1712	4.8
NORTH CENTRAL	EAST ORANGE	2	W0250	11.2
NORTH CENTRAL	EAST ORANGE	3	W0252	9.0
NORTH CENTRAL	EAST ORANGE	2	W0253	8.2
NORTH CENTRAL	EAST ORANGE	3	W0255	3.6
NORTH CENTRAL	EAST ORANGE	2	W0265	7.0
NORTH CENTRAL	EAST ORANGE	2	W0271	8.7
NORTH CENTRAL	EAST ORANGE	1	W0273	3.1
NORTH CENTRAL	EAST ORANGE	3	W0274	11.1
NORTH CENTRAL	EAST ORANGE	1	W0276	3.9
NORTH CENTRAL	EAST ORANGE	3	W0281	10.9
NORTH CENTRAL	EATONVILLE	1	M1131	11.5
NORTH CENTRAL	EATONVILLE	1	M1132	9.1
NORTH CENTRAL	EATONVILLE	1	M1133	7.7
NORTH CENTRAL	EATONVILLE	2	M1135	10.3
NORTH CENTRAL	EATONVILLE	2	M1136	7.3
NORTH CENTRAL	EATONVILLE	3	M1138	6.3
NORTH CENTRAL	EATONVILLE	3	M1139	9.0
NORTH CENTRAL	ECON	2	W0318	5.4
NORTH CENTRAL	ECON	1	W0320	8.0
NORTH CENTRAL	ECON	2	W0321	12.1
NORTH CENTRAL	ECON	2	W0324	10.5
NORTH CENTRAL	ECON	1	W0326	10.6
NORTH CENTRAL	ECON	2	W0327	10.7
NORTH CENTRAL	ECON	1	W0329	5.1
NORTH CENTRAL	EUSTIS	2	M0499	5.3
NORTH CENTRAL	EUSTIS	2	M0500	7.9
NORTH CENTRAL	EUSTIS	2	M0501	4.1
NORTH CENTRAL	EUSTIS	1	M0503	5.6
NORTH CENTRAL	EUSTIS	1	M0504	10.3
NORTH CENTRAL	EUSTIS SOUTH	2	M1054	5.0
NORTH CENTRAL	EUSTIS SOUTH	2	M1055	8.6
NORTH CENTRAL	EUSTIS SOUTH	2	M1056	6.3
NORTH CENTRAL	EUSTIS SOUTH	1	M1057	7.3
NORTH CENTRAL	EUSTIS SOUTH	1	M1058	7.1
NORTH CENTRAL	EUSTIS SOUTH	1	M1059	6.1
NORTH CENTRAL	FERN PARK	1	M0907	9.6
NORTH CENTRAL	FERN PARK	1	M0908	10.0
NORTH CENTRAL	FERN PARK	1	M0909	4.7
NORTH CENTRAL	HIGHBANKS	1	W0751	6.7

NORTH CENTRAL	HIGHBANKS	1	W0752	5.9
NORTH CENTRAL	KELLER ROAD	1	M0001	6.3
NORTH CENTRAL	KELLER ROAD	2	M0002	9.3
NORTH CENTRAL	KELLER ROAD	1	M0003	6.4
NORTH CENTRAL	KELLER ROAD	2	M0004	11.6
NORTH CENTRAL	KELLY PARK	2	M0821	7.5
NORTH CENTRAL	KELLY PARK	2	M0822	3.6
NORTH CENTRAL	LAKE ALOMA	1	W0151	5.5
NORTH CENTRAL	LAKE ALOMA	1	W0153	5.8
NORTH CENTRAL	LAKE ALOMA	2	W0158	3.2
NORTH CENTRAL	LAKE ALOMA	2	W0161	12.2
NORTH CENTRAL	LAKE EMMA	2	M0421	5.3
NORTH CENTRAL	LAKE EMMA	2	M0422	5.7
NORTH CENTRAL	LAKE EMMA	2	M0423	4.5
NORTH CENTRAL	LAKE EMMA	2	M0424	5.8
NORTH CENTRAL	LAKE EMMA	1	M0425	3.6
NORTH CENTRAL	LAKE EMMA	1	M0426	6.1
NORTH CENTRAL	LAKE EMMA	1	M0427	6.5
NORTH CENTRAL	LAKE EMMA	1	M0428	7.2
NORTH CENTRAL	LAKE HELEN	1	W1700	9.4
NORTH CENTRAL	LAKE HELEN	2	W1701	6.4
NORTH CENTRAL	LAKE HELEN	1	W1703	8.7
NORTH CENTRAL	LAKE HELEN	2	W1704	9.4
NORTH CENTRAL	LISBON	2	M1517	9.5
NORTH CENTRAL	LISBON	1	M1518	6.4
NORTH CENTRAL	LISBON	2	M1519	7.4
NORTH CENTRAL	LISBON	1	M1520	5.8
NORTH CENTRAL	LOCKHART	1	M0400	7.0
NORTH CENTRAL	LOCKHART	2	M0402	7.1
NORTH CENTRAL	LOCKHART	1	M0406	8.4
NORTH CENTRAL	LOCKHART	2	M0408	4.0
NORTH CENTRAL	LOCKHART	1	M0412	8.5
NORTH CENTRAL	LOCKHART	2	M0414	5.3
NORTH CENTRAL	LOCKHART	1	M0415	1.8
NORTH CENTRAL	LOCKHART	2	M0417	5.5
NORTH CENTRAL	LOCKWOOD	1	W0480	8.9
NORTH CENTRAL	LOCKWOOD	1	W0481	8.1
NORTH CENTRAL	LOCKWOOD	2	W0482	6.2
NORTH CENTRAL	LOCKWOOD	2	W0483	5.9
NORTH CENTRAL	LONGWOOD	1	M0142	11.2
NORTH CENTRAL	LONGWOOD	1	M0143	7.4
NORTH CENTRAL	LONGWOOD	2	M0144	13.3
NORTH CENTRAL	LONGWOOD	2	M0145	11.7
NORTH CENTRAL	MAITLAND	3	M0080	7.6

NORTH CENTRAL	MAITLAND	1	M0081	6.4
NORTH CENTRAL	MAITLAND	1	M0082	6.4
NORTH CENTRAL	MAITLAND	1	M0084	3.0
NORTH CENTRAL	MAITLAND	2	M0085	5.2
NORTH CENTRAL	MAITLAND	3	W0079	9.9
NORTH CENTRAL	MAITLAND	2	W0086	11.4
NORTH CENTRAL	MAITLAND	2	W0087	8.9
NORTH CENTRAL	MONASTERY	1	W0201	7.5
NORTH CENTRAL	MONASTERY	1	W0202	5.9
NORTH CENTRAL	MONASTERY	2	W0210	7.6
NORTH CENTRAL	MYRTLE LAKE	2	M0648	8.5
NORTH CENTRAL	MYRTLE LAKE	2	M0649	9.6
NORTH CENTRAL	MYRTLE LAKE	2	M0650	4.9
NORTH CENTRAL	MYRTLE LAKE	2	M0651	9.3
NORTH CENTRAL	MYRTLE LAKE	3	M0657	13.5
NORTH CENTRAL	MYRTLE LAKE	3	M0658	5.1
NORTH CENTRAL	MYRTLE LAKE	3	M0659	7.1
NORTH CENTRAL	NORTH LONGWOOD	6	M1749	8.3
NORTH CENTRAL	NORTH LONGWOOD	7	M1751	9.1
NORTH CENTRAL	NORTH LONGWOOD	6	M1755	5.7
NORTH CENTRAL	NORTH LONGWOOD	7	M1757	5.9
NORTH CENTRAL	NORTH LONGWOOD	6	M1758	10.7
NORTH CENTRAL	NORTH LONGWOOD	7	M1760	5.7
NORTH CENTRAL	NORTH LONGWOOD	6	M1761	7.2
NORTH CENTRAL	NORTH LONGWOOD	7	M1763	8.5
NORTH CENTRAL	ORANGE CITY	3	W0370	7.5
NORTH CENTRAL	ORANGE CITY	2	W0372	11.5
NORTH CENTRAL	ORANGE CITY	3	W0376	8.0
NORTH CENTRAL	ORANGE CITY	2	W0378	3.9
NORTH CENTRAL	ORANGE CITY	3	W0382	6.0
NORTH CENTRAL	OVIEDO	1	W0171	9.9
NORTH CENTRAL	OVIEDO	1	W0172	7.1
NORTH CENTRAL	OVIEDO	2	W0174	8.6
NORTH CENTRAL	OVIEDO	2	W0175	11.6
NORTH CENTRAL	OVIEDO	3	W0176	11.8
NORTH CENTRAL	OVIEDO	3	W0181	5.2
NORTH CENTRAL	PIEDMONT	2	M0471	8.9
NORTH CENTRAL	PIEDMONT	2	M0472	6.9
NORTH CENTRAL	PIEDMONT	2	M0473	8.9
NORTH CENTRAL	PIEDMONT	2	M0474	9.0
NORTH CENTRAL	PIEDMONT	1	M0475	8.2
NORTH CENTRAL	PIEDMONT	1	M0476	4.5
NORTH CENTRAL	PIEDMONT	1	M0477	7.7
NORTH CENTRAL	PIEDMONT	1	M0478	8.4

NORTH CENTRAL	PLYMOUTH SOUTH	1	M0702	4.9
NORTH CENTRAL	PLYMOUTH SOUTH	2	M0704	3.2
NORTH CENTRAL	PLYMOUTH SOUTH	2	M0706	7.7
NORTH CENTRAL	PLYMOUTH SOUTH	1	M0707	8.7
NORTH CENTRAL	SPRING LAKE	2	M0662	5.6
NORTH CENTRAL	SPRING LAKE	2	M0663	7.0
NORTH CENTRAL	SPRING LAKE	2	M0664	8.5
NORTH CENTRAL	SPRING LAKE	1	M0666	4.1
NORTH CENTRAL	SPRING LAKE	1	M0667	5.3
NORTH CENTRAL	SPRING LAKE	1	M0668	8.3
NORTH CENTRAL	SPRING LAKE	3	M0669	6.3
NORTH CENTRAL	SPRING LAKE	3	M0670	6.6
NORTH CENTRAL	SUNFLOWER	1	W0469	10.2
NORTH CENTRAL	SUNFLOWER	1	W0470	10.3
NORTH CENTRAL	SUNFLOWER	1	W0471	7.5
NORTH CENTRAL	SUNFLOWER	2	W0472	5.9
NORTH CENTRAL	SUNFLOWER	2	W0473	10.5
NORTH CENTRAL	SUNFLOWER	2	W0474	13.4
NORTH CENTRAL	SUNFLOWER	1	W0475	7.6
NORTH CENTRAL	TAVARES EAST	1	M0580	6.1
NORTH CENTRAL	TAVARES EAST	1	M0581	4.3
NORTH CENTRAL	TURNER PLANT	8	W0761	8.1
NORTH CENTRAL	TURNER PLANT	8	W0762	3.8
NORTH CENTRAL	TURNER PLANT	11	W0763	9.6
NORTH CENTRAL	TURNER PLANT	11	W0764	5.4
NORTH CENTRAL	UCF	1	W1012	9.4
NORTH CENTRAL	UCF	2	W1013	8.4
NORTH CENTRAL	UCF	1	W1014	2.7
NORTH CENTRAL	UCF	2	W1015	7.0
NORTH CENTRAL	UCF	2	W1016	11.6
NORTH CENTRAL	UCF	1	W1017	6.0
NORTH CENTRAL	UCF	2	W1018	5.5
NORTH CENTRAL	UCF NORTH	3	W0940	3.4
NORTH CENTRAL	UCF NORTH	1	W0942	2.4
NORTH CENTRAL	UCF NORTH	1	W0980	11.8
NORTH CENTRAL	UCF NORTH	2	W0981	7.4
NORTH CENTRAL	UCF NORTH	2	W0982	6.6
NORTH CENTRAL	UCF NORTH	1	W0983	5.3
NORTH CENTRAL	UCF NORTH	3	W0988	7.4
NORTH CENTRAL	UCF NORTH	1	W0989	11.4
NORTH CENTRAL	UCF NORTH	2	W0992	10.8
NORTH CENTRAL	UCF NORTH	3	W0994	10.3
NORTH CENTRAL	UMATILLA	2	M4405	6.8
NORTH CENTRAL	UMATILLA	1	M4407	7.0

NORTH CENTRAL	UMATILLA	1	M4408	9.4
NORTH CENTRAL	WEKIVA	1	M0101	5.1
NORTH CENTRAL	WEKIVA	2	M0103	4.6
NORTH CENTRAL	WEKIVA	2	M0104	4.8
NORTH CENTRAL	WEKIVA	1	M0106	4.4
NORTH CENTRAL	WEKIVA	1	M0107	6.3
NORTH CENTRAL	WEKIVA	2	M0109	6.0
NORTH CENTRAL	WEKIVA	2	M0110	7.6
NORTH CENTRAL	WEKIVA	1	M0112	5.4
NORTH CENTRAL	WEKIVA	2	M0113	6.0
NORTH CENTRAL	WEKIVA	1	M0115	4.6
NORTH CENTRAL	WELCH ROAD	1	M0542	7.9
NORTH CENTRAL	WELCH ROAD	1	M0543	4.6
NORTH CENTRAL	WELCH ROAD	3	M0545	6.5
NORTH CENTRAL	WELCH ROAD	3	M0548	6.7
NORTH CENTRAL	WELCH ROAD	1	M0550	9.3
NORTH CENTRAL	WELCH ROAD	1	M0552	5.5
NORTH CENTRAL	WELCH ROAD	3	M0554	6.8
NORTH CENTRAL	WEST CHAPMAN	3	W0700	8.4
NORTH CENTRAL	WEST CHAPMAN	2	W0702	9.2
NORTH CENTRAL	WEST CHAPMAN	3	W0703	7.7
NORTH CENTRAL	WEST CHAPMAN	2	W0705	7.8
NORTH CENTRAL	WEST CHAPMAN	3	W0708	10.8
NORTH CENTRAL	WINTER PARK	4	W0014	4.8
NORTH CENTRAL	WINTER PARK	4	W0015	6.7
NORTH CENTRAL	WINTER PARK	4	W0016	8.9
NORTH CENTRAL	WINTER PARK EAST	1	W0924	10.8
NORTH CENTRAL	WINTER PARK EAST	1	W0925	10.5
NORTH CENTRAL	WINTER PARK EAST	1	W0926	9.0
NORTH CENTRAL	WINTER PARK EAST	1	W0927	8.3
NORTH CENTRAL	WINTER PARK EAST	3	W0928	11.6
NORTH CENTRAL	WINTER PARK EAST	3	W0929	10.2
NORTH CENTRAL	WINTER PARK EAST	3	W0930	5.9
NORTH CENTRAL	WINTER PARK EAST	3	W0931	11.7
NORTH CENTRAL	WINTER SPRINGS	3	W0187	7.4
NORTH CENTRAL	WINTER SPRINGS	3	W0188	9.0
NORTH CENTRAL	WINTER SPRINGS	3	W0189	8.6
NORTH CENTRAL	WINTER SPRINGS	1	W0192	8.2
NORTH CENTRAL	WINTER SPRINGS	1	W0193	5.2
NORTH CENTRAL	WINTER SPRINGS	1	W0194	7.5
NORTH CENTRAL	WINTER SPRINGS	2	W0195	8.0
NORTH CENTRAL	WINTER SPRINGS	2	W0196	5.6
NORTH CENTRAL	WOLF LAKE	1	M0563	7.6
NORTH CENTRAL	WOLF LAKE	1	M0564	6.6

NORTH CENTRAL	ZELLWOOD	1	M0031	5.1
NORTH CENTRAL	ZELLWOOD	1	M0032	3.0
NORTH CENTRAL	ZELLWOOD	2	M0033	8.7
NORTH CENTRAL	ZELLWOOD	2	M0034	6.0
NORTH COASTAL	ADAMS	1	A0199	5.3
NORTH COASTAL	ADAMS	1	A0200	3.2
NORTH COASTAL	ALACHUA	1	A0143	1.0
NORTH COASTAL	ALACHUA	1	A0144	0.5
NORTH COASTAL	APALACHICOLA	1	N58	5.2
NORTH COASTAL	APALACHICOLA	2	N59	6.0
NORTH COASTAL	ARCHER	1	A0195	2.2
NORTH COASTAL	ARCHER	2	A0196	3.0
NORTH COASTAL	BEACON HILL	2	N515	1.5
NORTH COASTAL	BEACON HILL	1	N516	3.8
NORTH COASTAL	BEACON HILL	2	N527	4.7
NORTH COASTAL	BELLEVIEW	1	A0001	5.5
NORTH COASTAL	BELLEVIEW	2	A0002	7.5
NORTH COASTAL	BELLEVIEW	1	A0003	1.9
NORTH COASTAL	BELLEVIEW	2	A0004	7.1
NORTH COASTAL	BELLEVIEW	2	A0006	10.2
NORTH COASTAL	BELLEVIEW	1	A0012	3.4
NORTH COASTAL	BELLEVIEW	2	A0014	10.9
NORTH COASTAL	BEVERLY HILLS	2	A0072	6.3
NORTH COASTAL	BEVERLY HILLS	2	A0073	4.7
NORTH COASTAL	BEVERLY HILLS	1	A0074	7.1
NORTH COASTAL	BEVERLY HILLS	1	A0075	7.2
NORTH COASTAL	BEVILLES CORNER	1	A0561	2.2
NORTH COASTAL	BEVILLES CORNER	1	A0562	3.9
NORTH COASTAL	BROOKSVILLE	3	A0095	6.9
NORTH COASTAL	BROOKSVILLE	3	A0096	8.6
NORTH COASTAL	BROOKSVILLE	2	A0097	5.7
NORTH COASTAL	BROOKSVILLE	2	A0098	6.1
NORTH COASTAL	BUSHNELL EAST	1	A170	10.3
NORTH COASTAL	BUSHNELL EAST	1	A171	3.7
NORTH COASTAL	CARRABELLE	1	N42	2.2
NORTH COASTAL	CARRABELLE	1	N43	6.9
NORTH COASTAL	CARRABELLE BEACH	1	N48	2.6
NORTH COASTAL	CIRCLE SQUARE	2	A0250	6.8
NORTH COASTAL	CIRCLE SQUARE	1	A0251	7.7
NORTH COASTAL	CIRCLE SQUARE	1	A0253	5.8
NORTH COASTAL	CITRUS HILLS	2	A0282	6.7
NORTH COASTAL	CITRUS HILLS	3	A0283	5.6
NORTH COASTAL	CITRUS HILLS	2	A0284	8.2
NORTH COASTAL	CITRUS HILLS	3	A0285	4.2

NORTH COASTAL	CITRUS HILLS	2	A0286	6.2
NORTH COASTAL	COLEMAN	1	A0105	4.0
NORTH COASTAL	COLEMAN	2	A0107	3.3
NORTH COASTAL	COLEMAN	2	A0108	5.5
NORTH COASTAL	CRAWFORDVILLE	3	N35	6.5
NORTH COASTAL	CRAWFORDVILLE	2	N36	5.1
NORTH COASTAL	CROSS CITY	2	A0115	2.8
NORTH COASTAL	CROSS CITY	2	A0118	3.4
NORTH COASTAL	CROSS CITY	1	A0119	8.0
NORTH COASTAL	CROSS CITY INDUSTRIAL	1	A0046	5.0
NORTH COASTAL	CRYSTAL RIVER NORTH	1	A0161	7.4
NORTH COASTAL	CRYSTAL RIVER NORTH	1	A0162	6.4
NORTH COASTAL	CRYSTAL RIVER SOUTH	1	A0159	5.5
NORTH COASTAL	DUNNELLON TOWN	2	A0068	7.8
NORTH COASTAL	DUNNELLON TOWN	2	A0069	5.6
NORTH COASTAL	DUNNELLON TOWN	1	A0070	6.1
NORTH COASTAL	DUNNELLON TOWN	1	A0071	5.7
NORTH COASTAL	EAGLES NEST	2	A0224	6.2
NORTH COASTAL	EAGLES NEST	1	A0228	6.3
NORTH COASTAL	EAST POINT	1	N230	2.8
NORTH COASTAL	EAST POINT	1	N231	4.9
NORTH COASTAL	FLORAL CITY	1	A0087	4.1
NORTH COASTAL	FLORAL CITY	1	A0088	2.0
NORTH COASTAL	FORT WHITE	2	A0020	4.2
NORTH COASTAL	G.E. ALACHUA	1	A0185	0.6
NORTH COASTAL	G.E. ALACHUA	1	A0186	3.9
NORTH COASTAL	GEORGIA PACIFIC	1	A0045	6.5
NORTH COASTAL	HERNANDO AIRPORT	1	A0430	8.7
NORTH COASTAL	HERNANDO AIRPORT	1	A0431	11.1
NORTH COASTAL	HIGH SPRINGS	1	A0015	9.2
NORTH COASTAL	HIGH SPRINGS	2	A0016	6.4
NORTH COASTAL	HOLDER	1	A0047	6.3
NORTH COASTAL	HOLDER	2	A0048	6.4
NORTH COASTAL	HOLDER	1	A0049	5.2
NORTH COASTAL	HOMOSASSA	3	A0271	8.1
NORTH COASTAL	HOMOSASSA	3	A0272	7.7
NORTH COASTAL	INDIAN PASS	1	N556	11.5
NORTH COASTAL	INGLIS	2	A0078	5.0
NORTH COASTAL	INVERNESS	1	A0081	6.3
NORTH COASTAL	INVERNESS	1	A0082	7.5
NORTH COASTAL	INVERNESS	1	A0083	8.0
NORTH COASTAL	INVERNESS	2	A0084	8.4
NORTH COASTAL	INVERNESS	2	A0085	10.7
NORTH COASTAL	JASPER SOUTH	2	N191	5.0

NORTH COASTAL	JASPER SOUTH	1	N192	5.0
NORTH COASTAL	JENNINGS	1	N195	2.4
NORTH COASTAL	LADY LAKE	1	A0243	8.2
NORTH COASTAL	LADY LAKE	2	A0244	6.3
NORTH COASTAL	LADY LAKE	2	A0245	7.1
NORTH COASTAL	LADY LAKE	1	A0246	9.0
NORTH COASTAL	LAKE WEIR	1	A0061	5.5
NORTH COASTAL	LAKE WEIR	2	A0064	7.5
NORTH COASTAL	LEBANON	1	A0132	5.3
NORTH COASTAL	LURAVILLE	1	A0192	4.5
NORTH COASTAL	MADISON	2	N1	4.5
NORTH COASTAL	MADISON	2	N2	5.8
NORTH COASTAL	MADISON	1	N3	7.4
NORTH COASTAL	MADISON	1	N4	3.5
NORTH COASTAL	MARICAMP	1	A0333	10.9
NORTH COASTAL	MARICAMP	2	A0334	8.4
NORTH COASTAL	MARICAMP	1	A0335	7.8
NORTH COASTAL	MARICAMP	2	A0336	8.2
NORTH COASTAL	MARTIN	1	A0038	8.7
NORTH COASTAL	MARTIN	1	A0039	7.2
NORTH COASTAL	MCINTOSH	1	A0050	3.7
NORTH COASTAL	MCINTOSH	2	A0051	5.1
NORTH COASTAL	MONTICELLO	1	N66	3.6
NORTH COASTAL	MONTICELLO	1	N67	6.4
NORTH COASTAL	MONTICELLO	2	N68	2.4
NORTH COASTAL	MONTICELLO	2	N69	6.0
NORTH COASTAL	NEWBERRY	1	A0094	10.9
NORTH COASTAL	OBRIEN	1	A0379	4.6
NORTH COASTAL	OCHLOCKONEE	2	N37	4.8
NORTH COASTAL	OCHLOCKONEE	1	N38	4.6
NORTH COASTAL	ORANGE BLOSSOM	2	A0309	5.4
NORTH COASTAL	ORANGE BLOSSOM	1	A0310	8.0
NORTH COASTAL	ORANGE BLOSSOM	2	A0388	7.4
NORTH COASTAL	ORANGE BLOSSOM	1	A0389	7.0
NORTH COASTAL	ORANGE BLOSSOM	1	A0392	7.7
NORTH COASTAL	ORANGE BLOSSOM	2	A0394	10.1
NORTH COASTAL	PERRY	2	N10	7.0
NORTH COASTAL	PERRY	1	N7	5.6
NORTH COASTAL	PERRY	1	N8	2.3
NORTH COASTAL	PERRY	2	N9	6.2
NORTH COASTAL	PERRY NORTH	1	N14	7.4
NORTH COASTAL	PERRY NORTH	1	N15	8.6
NORTH COASTAL	PINE RIDGE	1	A0422	7.5
NORTH COASTAL	PINE RIDGE	1	A0423	7.7

NORTH COASTAL	PINE RIDGE	2	A0425	5.8
NORTH COASTAL	PORT ST. JOE	2	N52	3.8
NORTH COASTAL	PORT ST. JOE	2	N53	5.3
NORTH COASTAL	PORT ST. JOE	2	N54	4.7
NORTH COASTAL	PORT ST. JOE	2	N55	0.2
NORTH COASTAL	PORT ST. JOE INDUSTRIAL	1	N202	4.0
NORTH COASTAL	PORT ST. JOE INDUSTRIAL	1	N203	1.0
NORTH COASTAL	RAINBOW SPRINGS	1	A0368	5.6
NORTH COASTAL	RAINBOW SPRINGS	2	A0369	4.2
NORTH COASTAL	REDDICK	2	A0034	7.8
NORTH COASTAL	REDDICK	2	A0035	5.4
NORTH COASTAL	REDDICK	1	A0036	5.3
NORTH COASTAL	ROSS PRAIRIE	3	A0112	5.5
NORTH COASTAL	SANTOS	1	A0230	6.2
NORTH COASTAL	SANTOS	2	A0231	8.3
NORTH COASTAL	SANTOS	1	A0233	5.5
NORTH COASTAL	SILVER SPRINGS	3	A0153	10.5
NORTH COASTAL	SILVER SPRINGS	3	A0154	6.4
NORTH COASTAL	SILVER SPRINGS SHORES	2	A0128	5.5
NORTH COASTAL	SILVER SPRINGS SHORES	1	A0129	13.1
NORTH COASTAL	SILVER SPRINGS SHORES	1	A0130	7.2
NORTH COASTAL	SILVER SPRINGS SHORES	2	A0131	10.8
NORTH COASTAL	SOPCHOPPY	1	N327	5.3
NORTH COASTAL	SOUTHERN OAKS	2	A417	5.0
NORTH COASTAL	SOUTHERN OAKS	2	A418	5.0
NORTH COASTAL	SOUTHERN OAKS	2	A419	5.0
NORTH COASTAL	ST MARKS WEST	2	N331W	4.6
NORTH COASTAL	ST MARKS WEST	1	N332W	7.0
NORTH COASTAL	ST MARKS WEST	2	N336	3.3
NORTH COASTAL	ST. GEORGE ISLAND	1	N233	9.4
NORTH COASTAL	ST. GEORGE ISLAND	1	N234	4.3
NORTH COASTAL	SUWANNEE DISTRIBUTION	1	N0324	4.0
NORTH COASTAL	SUWANNEE DISTRIBUTION	1	N323	2.0
NORTH COASTAL	SUWANNEE DISTRIBUTION	2	N325	5.5
NORTH COASTAL	TANGERINE	2	A0262	10.7
NORTH COASTAL	TANGERINE	2	A0263	4.9
NORTH COASTAL	TANGERINE	2	A0264	4.4
NORTH COASTAL	TRENTON	1	A0090	6.3
NORTH COASTAL	TRENTON	1	A0091	2.0
NORTH COASTAL	TROPIC TERRACE	2	A0207	7.4
NORTH COASTAL	TROPIC TERRACE	2	A0208	3.0
NORTH COASTAL	TROPIC TERRACE	1	A0212	6.8
NORTH COASTAL	TWIN COUNTY RANCH	1	A0216	5.2
NORTH COASTAL	TWIN COUNTY RANCH	2	A0218	5.9

NORTH COASTAL	TWIN COUNTY RANCH	2	A0219	4.3
NORTH COASTAL	TWIN COUNTY RANCH	1	A0221	5.3
NORTH COASTAL	WAUKEENAH	2	N64	2.4
NORTH COASTAL	WAUKEENAH	1	N65	6.8
NORTH COASTAL	WEIRSDALE	1	A0321	8.1
NORTH COASTAL	WEIRSDALE	2	A0322	6.0
NORTH COASTAL	WHITE SPRINGS	2	N375	2.7
NORTH COASTAL	WILDWOOD CITY	1	A0395	8.5
NORTH COASTAL	WILDWOOD CITY	2	A0396	6.6
NORTH COASTAL	WILDWOOD CITY	2	A0397	3.8
NORTH COASTAL	WILDWOOD CITY	1	A0398	4.5
NORTH COASTAL	WILLISTON	1	A0124	7.6
NORTH COASTAL	WILLISTON	2	A0125	9.1
NORTH COASTAL	ZUBER	1	A0202	9.7
NORTH COASTAL	ZUBER	1	A0203	5.8
NORTH COASTAL	ZUBER	2	A0204	7.4
NORTH COASTAL	ZUBER	2	A0205	5.5
SOUTH CENTRAL	ARBUCKLE CREEK	1	K1361	3.5
SOUTH CENTRAL	AVALON	4	K37	7.2
SOUTH CENTRAL	AVALON	4	K38	1.0
SOUTH CENTRAL	AVON PARK NORTH	2	K0891	6.1
SOUTH CENTRAL	AVON PARK NORTH	2	K0892	2.1
SOUTH CENTRAL	AVON PARK NORTH	1	K0893	7.6
SOUTH CENTRAL	AVON PARK NORTH	1	K0894	4.9
SOUTH CENTRAL	AVON PARK PLANT	5	K0116	4.3
SOUTH CENTRAL	AVON PARK PLANT	5	K0117	5.4
SOUTH CENTRAL	AVON PARK PLANT	4	K0118	5.5
SOUTH CENTRAL	AVON PARK PLANT	4	K0119	8.7
SOUTH CENTRAL	BABSON PARK	1	K1195	3.3
SOUTH CENTRAL	BABSON PARK	1	K1196	3.7
SOUTH CENTRAL	BARNUM CITY	1	K1501	9.3
SOUTH CENTRAL	BARNUM CITY	2	K1503	10.9
SOUTH CENTRAL	BARNUM CITY	1	K3360	8.5
SOUTH CENTRAL	BARNUM CITY	2	K3362	13.8
SOUTH CENTRAL	BARNUM CITY	1	K3364	5.8
SOUTH CENTRAL	BAY HILL	3	K67	9.7
SOUTH CENTRAL	BAY HILL	3	K68	9.6
SOUTH CENTRAL	BAY HILL	1	K72	6.3
SOUTH CENTRAL	BAY HILL	1	K73	7.3
SOUTH CENTRAL	BAY HILL	1	K74	9.0
SOUTH CENTRAL	BAY HILL	2	K75	9.7
SOUTH CENTRAL	BAY HILL	2	K76	7.9
SOUTH CENTRAL	BAY HILL	2	K77	4.6
SOUTH CENTRAL	BAY HILL	3	K79	8.4

SOUTH CENTRAL	BOGGY MARSH	2	K957	8.3
SOUTH CENTRAL	BOGGY MARSH	1	K958	8.3
SOUTH CENTRAL	BOGGY MARSH	1	K959	10.9
SOUTH CENTRAL	BOGGY MARSH	2	K960	10.8
SOUTH CENTRAL	BOGGY MARSH	2	K961	10.7
SOUTH CENTRAL	BOGGY MARSH	1	K964	9.5
SOUTH CENTRAL	BONNET CREEK	2	K1230	2.3
SOUTH CENTRAL	BONNET CREEK	2	K1231	7.5
SOUTH CENTRAL	BONNET CREEK	2	K1234	4.5
SOUTH CENTRAL	BONNET CREEK	1	K973	3.1
SOUTH CENTRAL	BONNET CREEK	1	K974	8.0
SOUTH CENTRAL	BONNET CREEK	1	K975	6.2
SOUTH CENTRAL	BONNET CREEK	1	K976	6.7
SOUTH CENTRAL	CABBAGE ISLAND	3	K1613	4.6
SOUTH CENTRAL	CABBAGE ISLAND	2	K1614	6.6
SOUTH CENTRAL	CABBAGE ISLAND	3	K1615	2.2
SOUTH CENTRAL	CABBAGE ISLAND	2	K1616	8.6
SOUTH CENTRAL	CABBAGE ISLAND	2	K1618	6.9
SOUTH CENTRAL	CANOE CREEK	1	W0105	3.3
SOUTH CENTRAL	CELEBRATION	2	K2701	8.5
SOUTH CENTRAL	CELEBRATION	3	K2703	7.5
SOUTH CENTRAL	CELEBRATION	2	K2704	4.1
SOUTH CENTRAL	CELEBRATION	3	K2706	10.0
SOUTH CENTRAL	CENTRAL PARK	1	K0495	11.1
SOUTH CENTRAL	CENTRAL PARK	2	K499	5.2
SOUTH CENTRAL	CENTRAL PARK	3	K800	6.9
SOUTH CENTRAL	CENTRAL PARK	1	W0493	8.4
SOUTH CENTRAL	CENTRAL PARK	1	W0494	4.4
SOUTH CENTRAL	CENTRAL PARK	2	W0496	4.9
SOUTH CENTRAL	CENTRAL PARK	2	W0497	8.8
SOUTH CENTRAL	CENTRAL PARK	2	W0498	5.2
SOUTH CENTRAL	CENTRAL PARK	3	W0500	7.9
SOUTH CENTRAL	CENTRAL PARK	3	W0501	6.6
SOUTH CENTRAL	CHAMPIONS GATE	2	K1761	8.0
SOUTH CENTRAL	CHAMPIONS GATE	1	K1762	13.3
SOUTH CENTRAL	CHAMPIONS GATE	2	K1763	8.7
SOUTH CENTRAL	CHAMPIONS GATE	1	K1764	10.8
SOUTH CENTRAL	CITRUSVILLE	1	K0035	4.9
SOUTH CENTRAL	CITRUSVILLE	1	K0061	2.8
SOUTH CENTRAL	CITRUSVILLE	1	K0062	8.6
SOUTH CENTRAL	CLARCONA	1	M0337	8.9
SOUTH CENTRAL	CLARCONA	2	M0339	3.2
SOUTH CENTRAL	CLARCONA	2	M0340	5.7
SOUTH CENTRAL	CLARCONA	3	M0342	7.9

SOUTH CENTRAL	CLARCONA	1	M0343	8.2
SOUTH CENTRAL	CLARCONA	2	M0345	8.6
SOUTH CENTRAL	CLARCONA	2	M0346	10.3
SOUTH CENTRAL	CLARCONA	3	M0348	6.3
SOUTH CENTRAL	CLARCONA	3	M0351	6.6
SOUTH CENTRAL	CLERMONT	1	K601	10.7
SOUTH CENTRAL	CLERMONT	1	K602	8.0
SOUTH CENTRAL	CLERMONT	1	K603	9.5
SOUTH CENTRAL	CLERMONT	2	K605	6.7
SOUTH CENTRAL	CLERMONT	2	K606	10.3
SOUTH CENTRAL	CLERMONT	2	K607	8.8
SOUTH CENTRAL	COLONIAL	1	K2476	10.2
SOUTH CENTRAL	COLONIAL	1	K2477	4.3
SOUTH CENTRAL	CONWAY	2	W0404	7.5
SOUTH CENTRAL	CONWAY	2	W0405	7.7
SOUTH CENTRAL	CONWAY	1	W0407	6.2
SOUTH CENTRAL	CONWAY	1	W0408	10.2
SOUTH CENTRAL	COUNTRY OAKS	1	K1443	4.3
SOUTH CENTRAL	COUNTRY OAKS	1	K1446	2.0
SOUTH CENTRAL	COUNTRY OAKS	2	K1447	8.7
SOUTH CENTRAL	CROOKED LAKE	1	K1771	4.9
SOUTH CENTRAL	CROOKED LAKE	1	K1772	3.8
SOUTH CENTRAL	CROWN POINT	1	K278	9.8
SOUTH CENTRAL	CROWN POINT	1	K279	8.2
SOUTH CENTRAL	CURRY FORD	1	W0595	11.8
SOUTH CENTRAL	CURRY FORD	1	W0597	9.3
SOUTH CENTRAL	CURRY FORD	1	W0601	11.2
SOUTH CENTRAL	CURRY FORD	2	W596	8.7
SOUTH CENTRAL	CURRY FORD	2	W598	7.7
SOUTH CENTRAL	CYPRESSWOOD	1	K0317	3.5
SOUTH CENTRAL	CYPRESSWOOD	2	K0561	3.8
SOUTH CENTRAL	CYPRESSWOOD	2	K0562	11.4
SOUTH CENTRAL	CYPRESSWOOD	1	K0563	5.3
SOUTH CENTRAL	DAVENPORT	1	K0007	9.5
SOUTH CENTRAL	DAVENPORT	1	K0008	5.4
SOUTH CENTRAL	DAVENPORT	1	K0009	3.7
SOUTH CENTRAL	DESOTO CITY	1	K3220	5.9
SOUTH CENTRAL	DESOTO CITY	1	K3221	1.1
SOUTH CENTRAL	DESOTO CITY	2	K3222	1.9
SOUTH CENTRAL	DINNER LAKE	2	K1684	1.6
SOUTH CENTRAL	DINNER LAKE	2	K1685	7.1
SOUTH CENTRAL	DINNER LAKE	2	K1687	2.4
SOUTH CENTRAL	DINNER LAKE	2	K1688	4.2
SOUTH CENTRAL	DINNER LAKE	2	K1689	5.4

SOUTH CENTRAL	DINNER LAKE	1	K1690	6.9
SOUTH CENTRAL	DINNER LAKE	1	K1691	8.1
SOUTH CENTRAL	DUNDEE	2	K3244	7.6
SOUTH CENTRAL	DUNDEE	2	K3245	8.0
SOUTH CENTRAL	DUNDEE	2	K3246	1.7
SOUTH CENTRAL	EAST LAKE WALES	1	K1030	6.9
SOUTH CENTRAL	EAST LAKE WALES	2	K1031	2.9
SOUTH CENTRAL	EAST LAKE WALES	1	K1032	4.9
SOUTH CENTRAL	FISHEATING CREEK	1	K1560	8.8
SOUTH CENTRAL	FORT MEADE	3	K0170	0.4
SOUTH CENTRAL	FORT MEADE	3	K0171	2.2
SOUTH CENTRAL	FOUR CORNERS	1	K1404	7.2
SOUTH CENTRAL	FOUR CORNERS	2	K1406	6.8
SOUTH CENTRAL	FOUR CORNERS	1	K1407	6.1
SOUTH CENTRAL	FOUR CORNERS	2	K1409	4.1
SOUTH CENTRAL	FOUR CORNERS	3	K1410	3.5
SOUTH CENTRAL	FOUR CORNERS	2	K1412	7.2
SOUTH CENTRAL	FOUR CORNERS	3	K1414	4.4
SOUTH CENTRAL	FOUR CORNERS	3	K1416	11.5
SOUTH CENTRAL	FROSTPROOF	1	K0100	4.6
SOUTH CENTRAL	FROSTPROOF	1	K0101	5.4
SOUTH CENTRAL	FROSTPROOF	1	K0102	5.6
SOUTH CENTRAL	FROSTPROOF	2	K0103	1.8
SOUTH CENTRAL	FROSTPROOF	2	K0104	5.1
SOUTH CENTRAL	GIFFORD	1	K83	9.6
SOUTH CENTRAL	GIFFORD	1	K84	5.9
SOUTH CENTRAL	GROVELAND	1	K673	7.1
SOUTH CENTRAL	GROVELAND	1	K674	11.0
SOUTH CENTRAL	GROVELAND	2	K675	7.0
SOUTH CENTRAL	HAINES CITY	2	K0016	3.5
SOUTH CENTRAL	HAINES CITY	2	K0017	9.1
SOUTH CENTRAL	HAINES CITY	1	K0018	12.1
SOUTH CENTRAL	HAINES CITY	1	K0019	6.5
SOUTH CENTRAL	HAINES CITY	2	K0020	6.8
SOUTH CENTRAL	HAINES CITY	1	K0021	9.8
SOUTH CENTRAL	HAINES CITY	1	K0022	9.0
SOUTH CENTRAL	HEMPLE	2	K2244	11.1
SOUTH CENTRAL	HEMPLE	3	K2246	8.4
SOUTH CENTRAL	HEMPLE	2	K2247	7.6
SOUTH CENTRAL	HEMPLE	3	K2249	6.5
SOUTH CENTRAL	HEMPLE	1	K2250	8.3
SOUTH CENTRAL	HEMPLE	2	K2252	4.8
SOUTH CENTRAL	HEMPLE	3	K2253	8.3
SOUTH CENTRAL	HEMPLE	1	K2255	9.9

SOUTH CENTRAL	HOLOPAW	2	W0629	8.0
SOUTH CENTRAL	HOLOPAW	1	W0630	5.1
SOUTH CENTRAL	HOWEY	1	K564	3.1
SOUTH CENTRAL	HOWEY	1	K565	6.4
SOUTH CENTRAL	HUNTERS CREEK	1	K40	10.9
SOUTH CENTRAL	HUNTERS CREEK	2	K42	4.2
SOUTH CENTRAL	HUNTERS CREEK	2	K43	9.7
SOUTH CENTRAL	HUNTERS CREEK	3	K45	9.6
SOUTH CENTRAL	HUNTERS CREEK	3	K48	7.1
SOUTH CENTRAL	HUNTERS CREEK	3	K49	12.8
SOUTH CENTRAL	HUNTERS CREEK	1	K51	8.3
SOUTH CENTRAL	INTERCESSION CITY	1	K0966	2.3
SOUTH CENTRAL	INTERCESSION CITY	1	K0967	6.5
SOUTH CENTRAL	INTERNATIONAL DRIVE	3	K4815	8.4
SOUTH CENTRAL	INTERNATIONAL DRIVE	2	K4817	6.6
SOUTH CENTRAL	INTERNATIONAL DRIVE	3	K4818	8.8
SOUTH CENTRAL	INTERNATIONAL DRIVE	2	K4820	7.3
SOUTH CENTRAL	ISLEWORTH	1	K773	7.2
SOUTH CENTRAL	ISLEWORTH	2	K779	9.6
SOUTH CENTRAL	ISLEWORTH	3	K781	8.8
SOUTH CENTRAL	ISLEWORTH	3	K782	11.9
SOUTH CENTRAL	ISLEWORTH	2	K784	3.2
SOUTH CENTRAL	ISLEWORTH	1	K789	12.5
SOUTH CENTRAL	ISLEWORTH	2	K792	10.1
SOUTH CENTRAL	LAKE BRYAN	3	K230	7.2
SOUTH CENTRAL	LAKE BRYAN	3	K231	6.9
SOUTH CENTRAL	LAKE BRYAN	3	K232	7.7
SOUTH CENTRAL	LAKE BRYAN	2	K238	8.5
SOUTH CENTRAL	LAKE BRYAN	2	K239	3.5
SOUTH CENTRAL	LAKE BRYAN	1	K240	2.3
SOUTH CENTRAL	LAKE BRYAN	1	K242	2.8
SOUTH CENTRAL	LAKE BRYAN	2	K244	10.2
SOUTH CENTRAL	LAKE LUNTZ	1	K3282	10.2
SOUTH CENTRAL	LAKE LUNTZ	2	K3283	9.9
SOUTH CENTRAL	LAKE LUNTZ	1	K3284	12.2
SOUTH CENTRAL	LAKE LUNTZ	2	K3285	11.0
SOUTH CENTRAL	LAKE LUNTZ	2	K3286	10.4
SOUTH CENTRAL	LAKE LUNTZ	1	K3287	7.2
SOUTH CENTRAL	LAKE MARION	1	K1286	11.2
SOUTH CENTRAL	LAKE MARION	2	K1287	10.6
SOUTH CENTRAL	LAKE MARION	1	K1288	5.6
SOUTH CENTRAL	LAKE OF THE HILLS	1	K1884	7.8
SOUTH CENTRAL	LAKE OF THE HILLS	1	K1885	4.9
SOUTH CENTRAL	LAKE PLACID	1	K0757	3.5

SOUTH CENTRAL	LAKE PLACID	1	K0758	5.0
SOUTH CENTRAL	LAKE PLACID	2	K1066	7.9
SOUTH CENTRAL	LAKE PLACID	2	K1320	5.9
SOUTH CENTRAL	LAKE PLACID NORTH	1	K0024	3.5
SOUTH CENTRAL	LAKE PLACID NORTH	2	K0027	2.2
SOUTH CENTRAL	LAKE WALES	1	K0053	5.1
SOUTH CENTRAL	LAKE WALES	1	K0054	7.8
SOUTH CENTRAL	LAKE WALES	1	K0055	7.8
SOUTH CENTRAL	LAKE WALES	2	K0056	2.8
SOUTH CENTRAL	LAKE WALES	2	K0057	5.0
SOUTH CENTRAL	LAKE WALES	2	K0058	7.0
SOUTH CENTRAL	LAKE WILSON	1	K881	10.4
SOUTH CENTRAL	LAKE WILSON	1	K882	7.9
SOUTH CENTRAL	LAKE WILSON	2	K883	8.8
SOUTH CENTRAL	LAKE WILSON	2	K884	8.0
SOUTH CENTRAL	LAKEWOOD	1	K1693	7.1
SOUTH CENTRAL	LAKEWOOD	1	K1694	4.8
SOUTH CENTRAL	LAKEWOOD	1	K1695	5.1
SOUTH CENTRAL	LAKEWOOD	2	K1705	5.3
SOUTH CENTRAL	LAKEWOOD	2	K1706	8.2
SOUTH CENTRAL	LEISURE LAKES	1	K1415	6.4
SOUTH CENTRAL	LOUGHMAN	1	K5078	7.1
SOUTH CENTRAL	LOUGHMAN	1	K5079	10.5
SOUTH CENTRAL	LOUGHMAN	1	K5086	8.5
SOUTH CENTRAL	MAGNOLIA RANCH	2	W0502	12.9
SOUTH CENTRAL	MAGNOLIA RANCH	2	W0503	9.6
SOUTH CENTRAL	MAGNOLIA RANCH	1	W0504	9.6
SOUTH CENTRAL	MARLEY ROAD	1	K0120	8.4
SOUTH CENTRAL	MEADOW WOODS EAST	1	K1060	9.6
SOUTH CENTRAL	MEADOW WOODS EAST	1	K1061	8.8
SOUTH CENTRAL	MEADOW WOODS EAST	2	K1063	9.0
SOUTH CENTRAL	MEADOW WOODS SOUTH	2	K1775	9.9
SOUTH CENTRAL	MEADOW WOODS SOUTH	3	K1777	8.6
SOUTH CENTRAL	MEADOW WOODS SOUTH	2	K1778	9.2
SOUTH CENTRAL	MEADOW WOODS SOUTH	3	K1780	8.1
SOUTH CENTRAL	MEADOW WOODS SOUTH	2	K1781	9.5
SOUTH CENTRAL	MEADOW WOODS SOUTH	1	K1783	6.5
SOUTH CENTRAL	MEADOW WOODS SOUTH	1	K1789	5.2
SOUTH CENTRAL	MIDWAY	1	K1472	7.6
SOUTH CENTRAL	MIDWAY	1	K1473	11.9
SOUTH CENTRAL	MIDWAY	1	K1475	9.0
SOUTH CENTRAL	MINNEOLA	1	K946	6.0
SOUTH CENTRAL	MINNEOLA	2	K948	7.5
SOUTH CENTRAL	MINNEOLA	1	K949	7.9

SOUTH CENTRAL	MONTVERDE	1	K4831	10.3
SOUTH CENTRAL	MONTVERDE	2	K4833	6.6
SOUTH CENTRAL	MONTVERDE	1	K4834	7.3
SOUTH CENTRAL	MONTVERDE	2	K4836	8.4
SOUTH CENTRAL	MONTVERDE	1	K4837	8.7
SOUTH CENTRAL	MONTVERDE	2	K4840	10.2
SOUTH CENTRAL	MONTVERDE	1	K4841	12.1
SOUTH CENTRAL	MONTVERDE	2	K4845	6.4
SOUTH CENTRAL	NARCOOSSEE	1	W0212	9.3
SOUTH CENTRAL	NARCOOSSEE	2	W0216	12.5
SOUTH CENTRAL	NARCOOSSEE	2	W0217	14.2
SOUTH CENTRAL	NARCOOSSEE	3	W0219	14.0
SOUTH CENTRAL	NARCOOSSEE	3	W0220	11.6
SOUTH CENTRAL	NORTHRIDGE	1	K1822	9.4
SOUTH CENTRAL	NORTHRIDGE	1	K1825	6.9
SOUTH CENTRAL	OCOEE	3	M1086	6.4
SOUTH CENTRAL	OCOEE	3	M1087	7.1
SOUTH CENTRAL	OCOEE	3	M1088	4.1
SOUTH CENTRAL	OCOEE	1	M1090	9.2
SOUTH CENTRAL	OCOEE	1	M1091	5.3
SOUTH CENTRAL	OCOEE	1	M1092	8.4
SOUTH CENTRAL	OCOEE	2	M1094	8.1
SOUTH CENTRAL	OCOEE	2	M1095	5.3
SOUTH CENTRAL	OCOEE	2	M1096	9.9
SOUTH CENTRAL	OKAHUMPKA	1	K284	8.8
SOUTH CENTRAL	OKAHUMPKA	2	K285	5.9
SOUTH CENTRAL	OKAHUMPKA	2	K286	1.7
SOUTH CENTRAL	ORANGEWOOD	1	K217	3.5
SOUTH CENTRAL	ORANGEWOOD	2	K218	3.2
SOUTH CENTRAL	ORANGEWOOD	1	K220	2.4
SOUTH CENTRAL	ORANGEWOOD	1	K221	6.0
SOUTH CENTRAL	ORANGEWOOD	1	K222	7.8
SOUTH CENTRAL	ORANGEWOOD	1	K223	3.2
SOUTH CENTRAL	ORANGEWOOD	1	K224	3.5
SOUTH CENTRAL	ORANGEWOOD	2	K225	3.7
SOUTH CENTRAL	ORANGEWOOD	2	K226	7.0
SOUTH CENTRAL	ORANGEWOOD	2	K227	3.5
SOUTH CENTRAL	ORANGEWOOD	2	K228	8.5
SOUTH CENTRAL	ORANGEWOOD	2	K229	1.6
SOUTH CENTRAL	PARKWAY	1	K408	8.3
SOUTH CENTRAL	PARKWAY	1	K409	2.7
SOUTH CENTRAL	PEMBROKE	1	K3205	0.2
SOUTH CENTRAL	PINECASTLE	2	K0396	9.1
SOUTH CENTRAL	PINECASTLE	1	W0391	7.3

SOUTH CENTRAL	PINECASTLE	1	W0392	10.5
SOUTH CENTRAL	PINECASTLE	2	W0395	10.6
SOUTH CENTRAL	POINCIANA	1	K1236	7.2
SOUTH CENTRAL	POINCIANA	1	K1237	6.3
SOUTH CENTRAL	POINCIANA	2	K1508	7.7
SOUTH CENTRAL	POINCIANA	2	K1509	6.1
SOUTH CENTRAL	POINCIANA	2	K1556	10.6
SOUTH CENTRAL	POINCIANA	1	K1558	9.9
SOUTH CENTRAL	POINCIANA	2	K1561	8.3
SOUTH CENTRAL	POINCIANA	1	K1562	9.6
SOUTH CENTRAL	POINCIANA NORTH	3	K629	6.9
SOUTH CENTRAL	POINCIANA NORTH	3	K631	10.2
SOUTH CENTRAL	REEDY LAKE	2	K1102	10.0
SOUTH CENTRAL	REEDY LAKE	1	K1104	11.3
SOUTH CENTRAL	REEDY LAKE	2	K1108	10.2
SOUTH CENTRAL	REEDY LAKE	1	K1110	9.9
SOUTH CENTRAL	REEDY LAKE	1	K1111	8.8
SOUTH CENTRAL	RIO PINAR	1	W0968	9.8
SOUTH CENTRAL	RIO PINAR	1	W0969	11.1
SOUTH CENTRAL	RIO PINAR	1	W0970	12.0
SOUTH CENTRAL	RIO PINAR	4	W0971	12.0
SOUTH CENTRAL	RIO PINAR	4	W0972	11.7
SOUTH CENTRAL	RIO PINAR	4	W0973	12.5
SOUTH CENTRAL	RIO PINAR	4	W0974	10.5
SOUTH CENTRAL	RIO PINAR	1	W0975	8.9
SOUTH CENTRAL	SAND LAKE	1	K920	3.4
SOUTH CENTRAL	SAND LAKE	2	K922	6.8
SOUTH CENTRAL	SAND LAKE	2	K923	3.0
SOUTH CENTRAL	SAND LAKE	1	K925	4.8
SOUTH CENTRAL	SAND LAKE	1	K926	1.3
SOUTH CENTRAL	SAND LAKE	2	K928	4.5
SOUTH CENTRAL	SAND LAKE	2	K929	5.2
SOUTH CENTRAL	SAND LAKE	1	K931	3.1
SOUTH CENTRAL	SAND LAKE	1	K932	1.9
SOUTH CENTRAL	SAND LAKE	2	K934	5.1
SOUTH CENTRAL	SAND MOUNTAIN	1	K3201	0.3
SOUTH CENTRAL	SEBRING EAST	1	K0541	2.6
SOUTH CENTRAL	SEBRING EAST	1	K0542	4.0
SOUTH CENTRAL	SHINGLE CREEK	2	K855	7.4
SOUTH CENTRAL	SHINGLE CREEK	1	K857	9.0
SOUTH CENTRAL	SHINGLE CREEK	2	K858	7.4
SOUTH CENTRAL	SHINGLE CREEK	1	K860	6.9
SOUTH CENTRAL	SHINGLE CREEK	1	K861	7.3
SOUTH CENTRAL	SHINGLE CREEK	2	K863	9.3

SOUTH CENTRAL	SHINGLE CREEK	2	K868	4.6
SOUTH CENTRAL	SKY LAKE	1	W0362	7.7
SOUTH CENTRAL	SKY LAKE	1	W0363	11.1
SOUTH CENTRAL	SKY LAKE	1	W0364	7.2
SOUTH CENTRAL	SKY LAKE	2	W0365	10.1
SOUTH CENTRAL	SKY LAKE	2	W0366	5.8
SOUTH CENTRAL	SKY LAKE	3	W0367	8.2
SOUTH CENTRAL	SKY LAKE	3	W0368	5.3
SOUTH CENTRAL	SKY LAKE	3	W0369	10.3
SOUTH CENTRAL	SOUTH BARTOW	1	K0154	3.4
SOUTH CENTRAL	SUN'N LAKES	2	K1135	6.6
SOUTH CENTRAL	SUN'N LAKES	2	K1136	6.8
SOUTH CENTRAL	SUN'N LAKES	2	K1137	2.6
SOUTH CENTRAL	SUN'N LAKES	1	K1296	7.1
SOUTH CENTRAL	SUN'N LAKES	1	K1297	5.7
SOUTH CENTRAL	SUN'N LAKES	1	K1300	5.5
SOUTH CENTRAL	TAFT	2	K1023	5.7
SOUTH CENTRAL	TAFT	2	K1024	8.1
SOUTH CENTRAL	TAFT	2	K1025	7.2
SOUTH CENTRAL	TAFT	1	K1026	8.2
SOUTH CENTRAL	TAFT	1	K1027	3.8
SOUTH CENTRAL	TAFT	1	K1028	7.5
SOUTH CENTRAL	TAUNTON ROAD	1	K1081	7.8
SOUTH CENTRAL	TAUNTON ROAD	1	K1083	3.2
SOUTH CENTRAL	VINELAND	1	K901	7.7
SOUTH CENTRAL	VINELAND	2	K903	9.5
SOUTH CENTRAL	VINELAND	2	K904	10.2
SOUTH CENTRAL	VINELAND	3	K906	9.8
SOUTH CENTRAL	VINELAND	1	K907	4.8
SOUTH CENTRAL	VINELAND	2	K909	5.3
SOUTH CENTRAL	VINELAND	2	K910	9.1
SOUTH CENTRAL	VINELAND	3	K912	4.6
SOUTH CENTRAL	VINELAND	1	K913	9.5
SOUTH CENTRAL	VINELAND	3	K915	6.7
SOUTH CENTRAL	VINELAND	1	K917	8.0
SOUTH CENTRAL	WEST DAVENPORT	2	K1521	10.2
SOUTH CENTRAL	WEST DAVENPORT	1	K1523	7.0
SOUTH CENTRAL	WEST DAVENPORT	1	K1524	5.4
SOUTH CENTRAL	WEST DAVENPORT	2	K1526	11.2
SOUTH CENTRAL	WEST DAVENPORT	1	K1529	9.6
SOUTH CENTRAL	WEST LAKE WALES	2	K0866	5.0
SOUTH CENTRAL	WEST LAKE WALES	2	K0871	2.0
SOUTH CENTRAL	WESTRIDGE	1	K0420	8.4
SOUTH CENTRAL	WESTRIDGE	2	K0421	9.2

SOUTH CENTRAL	WESTRIDGE	1	K0425	12.2
SOUTH CENTRAL	WESTRIDGE	2	K0426	13.0
SOUTH CENTRAL	WESTRIDGE	2	K0428	4.6
SOUTH CENTRAL	WEWAHOOTEE	1	W1197	3.8
SOUTH CENTRAL	WEWAHOOTEE	1	W1198	0.9
SOUTH CENTRAL	WINDERMERE	3	K302	6.9
SOUTH CENTRAL	WINDERMERE	1	K303	8.6
SOUTH CENTRAL	WINDERMERE	1	K304	6.3
SOUTH CENTRAL	WINTER GARDEN	2	K201	11.7
SOUTH CENTRAL	WINTER GARDEN	2	K202	8.9
SOUTH CENTRAL	WINTER GARDEN	2	K203	6.4
SOUTH CENTRAL	WINTER GARDEN	1	K204	10.6
SOUTH CENTRAL	WINTER GARDEN	1	K205	11.4
SOUTH CENTRAL	WINTER GARDEN	1	K206	10.8
SOUTH CENTRAL	WINTER GARDEN	1	K207	10.2
SOUTH CENTRAL	WOODSMERE	3	M0252	5.9
SOUTH CENTRAL	WOODSMERE	3	M0253	4.4
SOUTH CENTRAL	WOODSMERE	3	M0254	6.1
SOUTH CENTRAL	WOODSMERE	4	M0255	6.8
SOUTH CENTRAL	WOODSMERE	4	M0256	7.8
SOUTH CENTRAL	WORLD GATEWAY	1	K187	8.7
SOUTH CENTRAL	WORLD GATEWAY	1	K189	6.3
SOUTH COASTAL	ALDERMAN	1	C5000	7.0
SOUTH COASTAL	ALDERMAN	1	C5001	5.1
SOUTH COASTAL	ALDERMAN	1	C5003	7.4
SOUTH COASTAL	ALDERMAN	2	C5008	8.6
SOUTH COASTAL	ALDERMAN	2	C5009	9.2
SOUTH COASTAL	ALDERMAN	3	C5010	4.6
SOUTH COASTAL	ALDERMAN	3	C5011	5.7
SOUTH COASTAL	ALDERMAN	3	C5012	11.4
SOUTH COASTAL	ALDERMAN	2	C5013	8.1
SOUTH COASTAL	ANCLOTE	8	C4201	10.5
SOUTH COASTAL	ANCLOTE	8	C4202	8.9
SOUTH COASTAL	ANCLOTE	8	C4203	9.6
SOUTH COASTAL	ANCLOTE	8	C4204	7.4
SOUTH COASTAL	ANCLOTE	7	C4206	8.9
SOUTH COASTAL	ANCLOTE	7	C4207	7.2
SOUTH COASTAL	ANCLOTE	7	C4208	7.3
SOUTH COASTAL	BAYBORO PLANT	2	X0009	8.2
SOUTH COASTAL	BAYBORO PLANT	1	X0010	3.5
SOUTH COASTAL	BAYBORO PLANT	2	X0013	3.8
SOUTH COASTAL	BAYBORO PLANT	1	X0015	3.7
SOUTH COASTAL	BAYBORO PLANT	2	X0016	9.4
SOUTH COASTAL	BAYBORO PLANT	1	X0017	3.2

SOUTH COASTAL	BAYBORO PLANT	2	X0018	9.0
SOUTH COASTAL	BAYBORO PLANT	1	X0019	8.3
SOUTH COASTAL	BAYBORO PLANT	1	X0020	5.7
SOUTH COASTAL	BAYBORO PLANT	2	X0021	7.1
SOUTH COASTAL	BAYVIEW	1	C0651	11.4
SOUTH COASTAL	BAYVIEW	1	C0652	9.9
SOUTH COASTAL	BAYVIEW	1	C0653	9.5
SOUTH COASTAL	BAYVIEW	1	C0654	8.2
SOUTH COASTAL	BAYVIEW	2	C0655	9.7
SOUTH COASTAL	BAYVIEW	2	C0656	10.1
SOUTH COASTAL	BAYVIEW	2	C0657	10.3
SOUTH COASTAL	BAYVIEW	2	C0658	5.5
SOUTH COASTAL	BAYWAY	2	X0096	9.1
SOUTH COASTAL	BAYWAY	2	X0097	10.8
SOUTH COASTAL	BAYWAY	2	X0099	11.1
SOUTH COASTAL	BAYWAY	2	X0100	2.7
SOUTH COASTAL	BELLEAIR	1	C1002	11.1
SOUTH COASTAL	BELLEAIR	1	C1003	8.9
SOUTH COASTAL	BELLEAIR	1	C1004	2.0
SOUTH COASTAL	BELLEAIR	2	C1005	10.7
SOUTH COASTAL	BELLEAIR	2	C1007	7.2
SOUTH COASTAL	BELLEAIR	2	C1008	11.7
SOUTH COASTAL	BELLEAIR	1	J1001	7.0
SOUTH COASTAL	BROOKER CREEK	1	C5400	6.0
SOUTH COASTAL	BROOKER CREEK	1	C5401	3.5
SOUTH COASTAL	BROOKER CREEK	1	C5402	7.1
SOUTH COASTAL	BROOKER CREEK	2	C5404	10.2
SOUTH COASTAL	BROOKER CREEK	2	C5405	10.6
SOUTH COASTAL	BROOKER CREEK	2	C5406	8.3
SOUTH COASTAL	CENTRAL PLAZA	1	X0262	7.9
SOUTH COASTAL	CENTRAL PLAZA	2	X0263	1.1
SOUTH COASTAL	CENTRAL PLAZA	1	X0264	6.9
SOUTH COASTAL	CENTRAL PLAZA	2	X0265	5.1
SOUTH COASTAL	CENTRAL PLAZA	1	X0266	1.2
SOUTH COASTAL	CENTRAL PLAZA	2	X0267	7.7
SOUTH COASTAL	CENTRAL PLAZA	1	X0268	7.8
SOUTH COASTAL	CLEARWATER	1	C0004	7.1
SOUTH COASTAL	CLEARWATER	1	C0005	11.8
SOUTH COASTAL	CLEARWATER	1	C0006	2.0
SOUTH COASTAL	CLEARWATER	1	C0007	5.5
SOUTH COASTAL	CLEARWATER	2	C0008	1.8
SOUTH COASTAL	CLEARWATER	2	C0009	2.6
SOUTH COASTAL	CLEARWATER	2	C0010	9.3
SOUTH COASTAL	CLEARWATER	2	C0011	9.4

SOUTH COASTAL	CLEARWATER	3	C0012	9.7
SOUTH COASTAL	CLEARWATER	3	C0013	3.6
SOUTH COASTAL	CLEARWATER	3	C0014	7.0
SOUTH COASTAL	CLEARWATER	3	C0015	6.4
SOUTH COASTAL	CLEARWATER	4	C0016	9.6
SOUTH COASTAL	CLEARWATER	4	C0017	9.6
SOUTH COASTAL	CLEARWATER	4	C0018	6.5
SOUTH COASTAL	CLEARWATER	4	C0019	5.4
SOUTH COASTAL	CROSS BAYOU	3	J0140	6.2
SOUTH COASTAL	CROSS BAYOU	3	J0141	10.9
SOUTH COASTAL	CROSS BAYOU	1	J0142	13.0
SOUTH COASTAL	CROSS BAYOU	1	J0143	11.1
SOUTH COASTAL	CROSS BAYOU	1	J0144	1.8
SOUTH COASTAL	CROSS BAYOU	1	J0145	8.8
SOUTH COASTAL	CROSS BAYOU	2	J0146	8.2
SOUTH COASTAL	CROSS BAYOU	2	J0147	10.8
SOUTH COASTAL	CROSS BAYOU	2	J0148	10.9
SOUTH COASTAL	CROSS BAYOU	3	J0150	9.9
SOUTH COASTAL	CROSSROADS	1	X0132	8.0
SOUTH COASTAL	CROSSROADS	1	X0133	8.4
SOUTH COASTAL	CROSSROADS	1	X0134	6.8
SOUTH COASTAL	CROSSROADS	2	X0135	9.6
SOUTH COASTAL	CROSSROADS	2	X0136	2.4
SOUTH COASTAL	CROSSROADS	2	X0137	3.3
SOUTH COASTAL	CROSSROADS	2	X0138	6.9
SOUTH COASTAL	CURLEW	3	C4972	7.6
SOUTH COASTAL	CURLEW	3	C4973	7.9
SOUTH COASTAL	CURLEW	2	C4976	9.5
SOUTH COASTAL	CURLEW	2	C4985	5.4
SOUTH COASTAL	CURLEW	2	C4986	9.1
SOUTH COASTAL	CURLEW	3	C4987	6.0
SOUTH COASTAL	CURLEW	3	C4988	9.0
SOUTH COASTAL	CURLEW	1	C4989	8.8
SOUTH COASTAL	CURLEW	1	C4990	9.5
SOUTH COASTAL	CURLEW	1	C4991	13.3
SOUTH COASTAL	DENHAM	1	C0151	8.4
SOUTH COASTAL	DENHAM	1	C0152	9.1
SOUTH COASTAL	DENHAM	2	C0153	9.8
SOUTH COASTAL	DENHAM	2	C0154	6.8
SOUTH COASTAL	DENHAM	2	C0155	12.1
SOUTH COASTAL	DENHAM	3	C0156	11.7
SOUTH COASTAL	DENHAM	3	C0157	10.7
SOUTH COASTAL	DENHAM	3	C0158	11.4
SOUTH COASTAL	DENHAM	1	C0159	10.1
SOUTH COASTAL	DISSTON	1	X0060	10.7
SOUTH COASTAL	DISSTON	1	X0061	4.2
SOUTH COASTAL	DISSTON	1	X0062	11.4
SOUTH COASTAL	DISSTON	1	X0063	10.7
SOUTH COASTAL	DISSTON	2	X0064	9.4

SOUTH COASTAL	DISSTON	2	X0065	2.7
SOUTH COASTAL	DISSTON	2	X0066	11.6
SOUTH COASTAL	DISSTON	2	X0067	8.8
SOUTH COASTAL	DUNEDIN	1	C0102	8.8
SOUTH COASTAL	DUNEDIN	1	C0103	9.7
SOUTH COASTAL	DUNEDIN	2	C0104	8.3
SOUTH COASTAL	DUNEDIN	2	C0106	5.7
SOUTH COASTAL	DUNEDIN	3	C0107	9.7
SOUTH COASTAL	DUNEDIN	3	C0108	7.9
SOUTH COASTAL	EAST CLEARWATER	1	C0900	9.7
SOUTH COASTAL	EAST CLEARWATER	1	C0901	6.2
SOUTH COASTAL	EAST CLEARWATER	1	C0902	11.8
SOUTH COASTAL	EAST CLEARWATER	1	C0903	7.1
SOUTH COASTAL	EAST CLEARWATER	2	C0904	9.9
SOUTH COASTAL	EAST CLEARWATER	2	C0905	7.6
SOUTH COASTAL	EAST CLEARWATER	2	C0906	8.6
SOUTH COASTAL	EAST CLEARWATER	2	C0907	10.5
SOUTH COASTAL	EAST CLEARWATER	3	C0908	5.7
SOUTH COASTAL	EAST CLEARWATER	3	C0909	8.5
SOUTH COASTAL	EAST CLEARWATER	3	C0910	10.4
SOUTH COASTAL	EAST CLEARWATER	3	C0911	8.2
SOUTH COASTAL	ELFERS	2	C0950	7.1
SOUTH COASTAL	ELFERS	2	C0951	6.8
SOUTH COASTAL	ELFERS	2	C0952	7.9
SOUTH COASTAL	ELFERS	2	C0953	7.0
SOUTH COASTAL	ELFERS	1	C0954	4.8
SOUTH COASTAL	ELFERS	1	C0955	10.7
SOUTH COASTAL	ELFERS	1	C0956	10.7
SOUTH COASTAL	ELFERS	1	C0957	9.3
SOUTH COASTAL	FIFTY FIRST STREET	2	X0101	6.1
SOUTH COASTAL	FIFTY FIRST STREET	1	X0102	8.4
SOUTH COASTAL	FIFTY FIRST STREET	2	X0103	9.7
SOUTH COASTAL	FIFTY FIRST STREET	1	X0104	5.5
SOUTH COASTAL	FIFTY FIRST STREET	2	X0105	8.9
SOUTH COASTAL	FIFTY FIRST STREET	1	X0106	4.0
SOUTH COASTAL	FIFTY FIRST STREET	2	X0107	7.7
SOUTH COASTAL	FIFTY FIRST STREET	1	X0108	6.5
SOUTH COASTAL	FLORA-MAR	1	C4000	8.1
SOUTH COASTAL	FLORA-MAR	1	C4001	8.2
SOUTH COASTAL	FLORA-MAR	1	C4002	10.2
SOUTH COASTAL	FLORA-MAR	1	C4003	8.7
SOUTH COASTAL	FLORA-MAR	2	C4006	10.2
SOUTH COASTAL	FLORA-MAR	2	C4007	7.8
SOUTH COASTAL	FLORA-MAR	2	C4008	7.4
SOUTH COASTAL	FLORA-MAR	2	C4009	8.8
SOUTH COASTAL	FORTIETH STREET	1	X0081	5.4
SOUTH COASTAL	FORTIETH STREET	1	X0082	8.9
SOUTH COASTAL	FORTIETH STREET	2	X0083	7.7
SOUTH COASTAL	FORTIETH STREET	2	X0084	8.0
SOUTH COASTAL	FORTIETH STREET	2	X0085	6.6
SOUTH COASTAL	G E PINELLAS	1	J0231	2.4
SOUTH COASTAL	G E PINELLAS	2	J0234	2.4

SOUTH COASTAL	G E PINELLAS	2	J0235	1.2
SOUTH COASTAL	GATEWAY	1	X0111	9.8
SOUTH COASTAL	GATEWAY	1	X0112	7.6
SOUTH COASTAL	GATEWAY	1	X0113	8.7
SOUTH COASTAL	GATEWAY	1	X0114	3.9
SOUTH COASTAL	GATEWAY	2	X0118	8.0
SOUTH COASTAL	GATEWAY	2	X0119	8.0
SOUTH COASTAL	GATEWAY	2	X0120	8.6
SOUTH COASTAL	GATEWAY	3	X0121	9.6
SOUTH COASTAL	GATEWAY	3	X0122	3.5
SOUTH COASTAL	GATEWAY	3	X0123	6.5
SOUTH COASTAL	GATEWAY	3	X0125	5.4
SOUTH COASTAL	HIGHLANDS	2	C2802	8.3
SOUTH COASTAL	HIGHLANDS	2	C2803	8.3
SOUTH COASTAL	HIGHLANDS	2	C2804	6.8
SOUTH COASTAL	HIGHLANDS	1	C2805	8.5
SOUTH COASTAL	HIGHLANDS	1	C2806	9.9
SOUTH COASTAL	HIGHLANDS	1	C2807	7.8
SOUTH COASTAL	HIGHLANDS	2	C2808	8.4
SOUTH COASTAL	KENNETH	1	X0050	9.2
SOUTH COASTAL	KENNETH	1	X0051	7.8
SOUTH COASTAL	KENNETH	1	X0052	0.4
SOUTH COASTAL	KENNETH	1	X0053	9.9
SOUTH COASTAL	KENNETH	2	X0054	0.4
SOUTH COASTAL	KENNETH	2	X0055	4.9
SOUTH COASTAL	KENNETH	2	X0056	8.1
SOUTH COASTAL	KENNETH	2	X0057	9.7
SOUTH COASTAL	LAND-O-LAKES	1	C0140	10.0
SOUTH COASTAL	LAND-O-LAKES	1	C0141	12.8
SOUTH COASTAL	LAND-O-LAKES	1	C0143	13.7
SOUTH COASTAL	LAND-O-LAKES	2	C0146	8.7
SOUTH COASTAL	LAND-O-LAKES	2	C0148	9.4
SOUTH COASTAL	LARGO	1	J0402	3.4
SOUTH COASTAL	LARGO	1	J0403	9.5
SOUTH COASTAL	LARGO	1	J0404	8.0
SOUTH COASTAL	LARGO	1	J0405	7.0
SOUTH COASTAL	LARGO	2	J0406	7.4
SOUTH COASTAL	LARGO	2	J0407	11.0
SOUTH COASTAL	LARGO	2	J0408	5.6
SOUTH COASTAL	LARGO	2	J0409	6.6
SOUTH COASTAL	MAXIMO	3	X0140	9.5
SOUTH COASTAL	MAXIMO	3	X0141	9.5
SOUTH COASTAL	MAXIMO	3	X0142	9.4
SOUTH COASTAL	MAXIMO	1	X0143	11.2
SOUTH COASTAL	MAXIMO	1	X0144	0.7
SOUTH COASTAL	MAXIMO	1	X0146	8.2
SOUTH COASTAL	MAXIMO	1	X0147	10.3
SOUTH COASTAL	MAXIMO	2	X0149	10.9
SOUTH COASTAL	MAXIMO	2	X0150	8.1
SOUTH COASTAL	MAXIMO	2	X0151	11.4
SOUTH COASTAL	MAXIMO	2	X0152	0.7
SOUTH COASTAL	NEW PORT RICHEY	1	C0441	7.7

SOUTH COASTAL	NEW PORT RICHEY	1	C0442	7.0
SOUTH COASTAL	NEW PORT RICHEY	2	C0443	9.7
SOUTH COASTAL	NEW PORT RICHEY	2	C0444	7.2
SOUTH COASTAL	NORTHEAST	1	X0282	6.7
SOUTH COASTAL	NORTHEAST	1	X0283	6.6
SOUTH COASTAL	NORTHEAST	1	X0284	12.4
SOUTH COASTAL	NORTHEAST	1	X0285	8.4
SOUTH COASTAL	NORTHEAST	1	X0286	9.2
SOUTH COASTAL	NORTHEAST	2	X0287	11.2
SOUTH COASTAL	NORTHEAST	2	X0288	9.9
SOUTH COASTAL	NORTHEAST	2	X0289	9.8
SOUTH COASTAL	NORTHEAST	2	X0290	6.6
SOUTH COASTAL	NORTHEAST	2	X0291	3.0
SOUTH COASTAL	OAKHURST	1	J0221	8.4
SOUTH COASTAL	OAKHURST	3	J0223	8.8
SOUTH COASTAL	OAKHURST	3	J0224	9.4
SOUTH COASTAL	OAKHURST	2	J0226	10.7
SOUTH COASTAL	OAKHURST	2	J0227	8.8
SOUTH COASTAL	OAKHURST	1	J0228	9.7
SOUTH COASTAL	OAKHURST	1	J0229	8.2
SOUTH COASTAL	ODESSA	1	C4318	6.7
SOUTH COASTAL	ODESSA	2	C4320	11.6
SOUTH COASTAL	ODESSA	1	C4322	8.3
SOUTH COASTAL	ODESSA	2	C4323	10.3
SOUTH COASTAL	ODESSA	2	C4328	8.7
SOUTH COASTAL	ODESSA	1	C4329	8.8
SOUTH COASTAL	OLDSMAR	2	C0604	1.7
SOUTH COASTAL	PALM HARBOR	1	C0752	8.0
SOUTH COASTAL	PALM HARBOR	1	C0753	8.1
SOUTH COASTAL	PALM HARBOR	2	C0755	9.2
SOUTH COASTAL	PALM HARBOR	2	C0756	7.8
SOUTH COASTAL	PALM HARBOR	2	C0757	10.0
SOUTH COASTAL	PASADENA	2	X0211	10.6
SOUTH COASTAL	PASADENA	2	X0212	6.2
SOUTH COASTAL	PASADENA	2	X0213	5.9
SOUTH COASTAL	PASADENA	2	X0214	6.8
SOUTH COASTAL	PASADENA	2	X0215	3.6
SOUTH COASTAL	PASADENA	1	X0216	5.4
SOUTH COASTAL	PASADENA	1	X0217	4.2
SOUTH COASTAL	PASADENA	1	X0219	10.4
SOUTH COASTAL	PASADENA	1	X0220	7.9
SOUTH COASTAL	PILSBURY	1	X0252	3.9
SOUTH COASTAL	PILSBURY	1	X0253	2.1
SOUTH COASTAL	PILSBURY	1	X0254	9.9
SOUTH COASTAL	PILSBURY	1	X0255	10.3
SOUTH COASTAL	PILSBURY	2	X0256	1.2
SOUTH COASTAL	PILSBURY	2	X0257	10.6
SOUTH COASTAL	PILSBURY	2	X0258	9.3
SOUTH COASTAL	PILSBURY	2	X0259	10.8
SOUTH COASTAL	PINELLAS WELL FIELD	1	C801	1.4
SOUTH COASTAL	PINELLAS WELL FIELD	1	C802	0.7
SOUTH COASTAL	PORT RICHEY WEST	2	C0202	9.5

SOUTH COASTAL	PORT RICHEY WEST	2	C0203	8.3
SOUTH COASTAL	PORT RICHEY WEST	1	C0205	5.0
SOUTH COASTAL	PORT RICHEY WEST	1	C0206	9.7
SOUTH COASTAL	PORT RICHEY WEST	1	C0207	6.8
SOUTH COASTAL	PORT RICHEY WEST	3	C0208	7.6
SOUTH COASTAL	PORT RICHEY WEST	3	C0209	9.6
SOUTH COASTAL	PORT RICHEY WEST	3	C0210	8.4
SOUTH COASTAL	SAFETY HARBOR	1	C3518	6.6
SOUTH COASTAL	SAFETY HARBOR	2	C3521	8.7
SOUTH COASTAL	SAFETY HARBOR	2	C3523	7.0
SOUTH COASTAL	SAFETY HARBOR	2	C3524	8.9
SOUTH COASTAL	SAFETY HARBOR	1	C3525	9.0
SOUTH COASTAL	SAFETY HARBOR	1	C3527	9.5
SOUTH COASTAL	SAFETY HARBOR	1	C3528	8.3
SOUTH COASTAL	SEMINOLE	2	J0889	12.0
SOUTH COASTAL	SEMINOLE	2	J0890	10.5
SOUTH COASTAL	SEMINOLE	2	J0891	6.4
SOUTH COASTAL	SEMINOLE	1	J0892	10.9
SOUTH COASTAL	SEMINOLE	1	J0893	6.7
SOUTH COASTAL	SEMINOLE	1	J0894	9.4
SOUTH COASTAL	SEMINOLE	1	J0895	11.1
SOUTH COASTAL	SEMINOLE	2	J888	7.0
SOUTH COASTAL	SEVEN SPRINGS	4	C4500	6.8
SOUTH COASTAL	SEVEN SPRINGS	4	C4501	9.5
SOUTH COASTAL	SEVEN SPRINGS	6	C4502	7.1
SOUTH COASTAL	SEVEN SPRINGS	5	C4507	7.4
SOUTH COASTAL	SEVEN SPRINGS	5	C4508	12.5
SOUTH COASTAL	SEVEN SPRINGS	5	C4509	7.8
SOUTH COASTAL	SEVEN SPRINGS	4	C4510	7.0
SOUTH COASTAL	SEVEN SPRINGS	6	C4512	8.0
SOUTH COASTAL	SIXTEENTH STREET	1	X0031	9.3
SOUTH COASTAL	SIXTEENTH STREET	2	X0032	2.0
SOUTH COASTAL	SIXTEENTH STREET	1	X0033	3.9
SOUTH COASTAL	SIXTEENTH STREET	2	X0034	12.2
SOUTH COASTAL	SIXTEENTH STREET	1	X0035	3.0
SOUTH COASTAL	SIXTEENTH STREET	2	X0036	7.8
SOUTH COASTAL	SIXTEENTH STREET	2	X0042	5.8
SOUTH COASTAL	SIXTEENTH STREET	1	X0043	5.1
SOUTH COASTAL	SIXTEENTH STREET	1	X0045	8.8
SOUTH COASTAL	SIXTEENTH STREET	2	X0046	9.3
SOUTH COASTAL	STARKEY ROAD	1	J0112	7.6
SOUTH COASTAL	STARKEY ROAD	1	J0113	5.0
SOUTH COASTAL	STARKEY ROAD	1	J0114	7.6
SOUTH COASTAL	STARKEY ROAD	2	J0115	9.5
SOUTH COASTAL	STARKEY ROAD	2	J0116	11.5
SOUTH COASTAL	STARKEY ROAD	2	J0117	3.4
SOUTH COASTAL	STARKEY ROAD	2	J0118	8.9
SOUTH COASTAL	TARPON SPRINGS	1	C0301	6.8
SOUTH COASTAL	TARPON SPRINGS	1	C0302	8.7
SOUTH COASTAL	TARPON SPRINGS	1	C0303	9.4
SOUTH COASTAL	TARPON SPRINGS	1	C0304	10.9
SOUTH COASTAL	TARPON SPRINGS	2	C0305	9.9

SOUTH COASTAL	TARPON SPRINGS	2	C0306	7.8
SOUTH COASTAL	TARPON SPRINGS	2	C0307	11.2
SOUTH COASTAL	TARPON SPRINGS	2	C0308	7.4
SOUTH COASTAL	TAYLOR AVENUE	2	J2901	6.8
SOUTH COASTAL	TAYLOR AVENUE	2	J2902	8.7
SOUTH COASTAL	TAYLOR AVENUE	2	J2903	9.4
SOUTH COASTAL	TAYLOR AVENUE	2	J2904	10.9
SOUTH COASTAL	TAYLOR AVENUE	1	J2905	9.9
SOUTH COASTAL	TAYLOR AVENUE	1	J2906	7.8
SOUTH COASTAL	TAYLOR AVENUE	1	J2907	11.2
SOUTH COASTAL	THIRTY SECOND STREET	1	X0022	7.1
SOUTH COASTAL	THIRTY SECOND STREET	1	X0023	4.0
SOUTH COASTAL	THIRTY SECOND STREET	1	X0024	5.1
SOUTH COASTAL	THIRTY SECOND STREET	1	X0025	7.6
SOUTH COASTAL	THIRTY SECOND STREET	2	X0026	7.6
SOUTH COASTAL	THIRTY SECOND STREET	2	X0027	9.9
SOUTH COASTAL	THIRTY SECOND STREET	2	X0028	9.0
SOUTH COASTAL	THIRTY SECOND STREET	3	X0029	8.0
SOUTH COASTAL	THIRTY SECOND STREET	3	X0030	11.9
SOUTH COASTAL	THIRTY SECOND STREET	3	X0037	9.3
SOUTH COASTAL	TRI-CITY	3	J5030	7.5
SOUTH COASTAL	TRI-CITY	3	J5032	9.3
SOUTH COASTAL	TRI-CITY	2	J5034	9.0
SOUTH COASTAL	TRI-CITY	2	J5036	4.4
SOUTH COASTAL	TRI-CITY	2	J5038	8.3
SOUTH COASTAL	TRI-CITY	3	J5040	8.5
SOUTH COASTAL	ULMERTON	1	J0240	8.4
SOUTH COASTAL	ULMERTON	1	J0241	9.3
SOUTH COASTAL	ULMERTON	1	J0242	11.7
SOUTH COASTAL	ULMERTON	1	J0243	9.6
SOUTH COASTAL	ULMERTON	2	J0244	8.2
SOUTH COASTAL	ULMERTON	2	J0245	4.6
SOUTH COASTAL	ULMERTON	2	J0246	5.0
SOUTH COASTAL	ULMERTON	2	J0247	9.1
SOUTH COASTAL	ULMERTON WEST	1	J0680	6.0
SOUTH COASTAL	ULMERTON WEST	1	J0682	10.6
SOUTH COASTAL	ULMERTON WEST	1	J0684	9.0
SOUTH COASTAL	ULMERTON WEST	2	J0689	5.3
SOUTH COASTAL	ULMERTON WEST	2	J0690	8.1
SOUTH COASTAL	ULMERTON WEST	2	J0691	7.6
SOUTH COASTAL	ULMERTON WEST	2	J0692	6.4
SOUTH COASTAL	VINOY	1	X0070	9.8
SOUTH COASTAL	VINOY	2	X0071	6.0
SOUTH COASTAL	VINOY	2	X0072	11.7
SOUTH COASTAL	VINOY	2	X0074	2.4
SOUTH COASTAL	VINOY	2	X0075	3.4
SOUTH COASTAL	VINOY	1	X0076	4.4
SOUTH COASTAL	VINOY	1	X0077	4.9
SOUTH COASTAL	VINOY	1	X0078	11.4
SOUTH COASTAL	VINOY	1	X0079	4.3
SOUTH COASTAL	VINOY	1	X0080	7.1
SOUTH COASTAL	WALSINGHAM	2	J0551	11.4

SOUTH COASTAL	WALSINGHAM	2	J0552	9.4
SOUTH COASTAL	WALSINGHAM	2	J0553	7.4
SOUTH COASTAL	WALSINGHAM	2	J0554	9.6
SOUTH COASTAL	WALSINGHAM	1	J0555	8.8
SOUTH COASTAL	WALSINGHAM	1	J0556	9.1
SOUTH COASTAL	WALSINGHAM	1	J0557	10.8
SOUTH COASTAL	WALSINGHAM	1	J0558	8.1
SOUTH COASTAL	ZEPHYRHILLS	2	C0851	10.1
SOUTH COASTAL	ZEPHYRHILLS	2	C0852	7.9
SOUTH COASTAL	ZEPHYRHILLS	2	C0853	4.5
SOUTH COASTAL	ZEPHYRHILLS	1	C0854	5.2
SOUTH COASTAL	ZEPHYRHILLS	1	C0855	9.5
SOUTH COASTAL	ZEPHYRHILLS	1	C0856	9.3
SOUTH COASTAL	ZEPHYRHILLS	1	C0857	4.6
SOUTH COASTAL	ZEPHYRHILLS NORTH	2	C0340	9.8
SOUTH COASTAL	ZEPHYRHILLS NORTH	2	C0341	8.3
SOUTH COASTAL	ZEPHYRHILLS NORTH	1	C0342	7.6
SOUTH COASTAL	ZEPHYRHILLS NORTH	1	C0343	9.1
SOUTH COASTAL	ZEPHYRHILLS NORTH	1	C0344	8.7
SOUTH COASTAL	ZEPHYRHILLS NORTH	2	C0345	3.9

ATTACHMENT G

2021 FEEDER SPECIFIC DATA

PROVIDED ON CD

ATTACHMENT H

Received Jan 1 to Dec 31, 2021

63 Complaints

DEF logged as Power Quality & Reliability

Date Received	PSC Complaint #	DEF Category	PSC Ruling	PSC Closure Code
1/7/2021	1359117E	Outage	Non-Infraction	GI-15 Outages
1/19/2021	1360493E	Lighting	Non-Infraction	GI-11 Repair Service
1/20/2021	1360566E	Outage	Non-Infraction	GI-15 Outages
1/25/2021	1361105E	Outage	Non-Infraction	GI-15 Outages
1/25/2021	1361053E	Vegetation Management Distribution	Non-Infraction	GI-30 Quality of Service
2/1/2021	1361704E	Outage	Non-Infraction	GI-15 Outages
2/9/2021	1362836C	Lighting	Non-Infraction	GI-11 Repair Service
3/8/2021	1364849E	Outage	Non-Infraction	GI-15 Outages
3/25/2021	1365897E	Equipment/Facilities Issues	Non-Infraction	GI-30 Quality of Service
4/12/2021	1366664E	Outage	Non-Infraction	GI-15 Outages
4/12/2021	1366672E	Outage	Non-Infraction	GI-15 Outages
4/12/2021	1366689E	Outage	Non-Infraction	GI-15 Outages
4/12/2021	1366687E	Outage	Non-Infraction	GI-15 Outages
4/15/2021	1366926E	Outage	Non-Infraction	GI-15 Outages
4/21/2021	1367195E	Outage	Non-Infraction	GI-15 Outages
4/26/2021	1367452E	Lighting	Non-Infraction	GI-32 Process Review
5/7/2021	1368075E	Lighting	Non-Infraction	GI-11 Repair Service
5/10/2021	1368094E	Outage	Non-Infraction	GI-15 Outages
5/21/2021	1368744E	Outage	Non-Infraction	GI-15 Outages
5/28/2021	1369260E	Outage	Non-Infraction	GI-15 Outages
6/1/2021	1369323E	Voltage Problems	Non-Infraction	GI-15 Outages
6/4/2021	1369611E	Equipment/Facilities Issues	Non-Infraction	GI-17 Safety Issues
6/28/2021	1372743E	Outage	Non-Infraction	GI-15 Outages
7/6/2021	1373353E	Outage	Non-Infraction	GI-15 Outages
7/13/2021	1373981E	Vegetation Management Distribution	Non-Infraction	GI-18 Tree Trimming
7/14/2021	1374128E	Outage	Non-Infraction	GI-15 Outages
7/16/2021	1374348E	Outage	Non-Infraction	GI-15 Outages
7/19/2021	1374522E	Equipment/Facilities Issues	Non-Infraction	GI-11 Repair Service
7/21/2021	1374720E	Outage	Non-Infraction	GI-15 Outages
7/23/2021	1374851E	Outage	Non-Infraction	GI-15 Outages
7/26/2021	1374875E	Outage	Non-Infraction	GI-15 Outages
7/26/2021	1374905E	Equipment/Facilities Issues	Non-Infraction	GI-11 Repair Service
7/28/2021	1375152E	Outage	Non-Infraction	GI-15 Outages
7/28/2021	1375188E	Outage	Non-Infraction	GI-15 Outages

Received Jan 1 to Dec 31, 2021

49 Complaints

PSC Service Reliability Only Closure Codes

Date Received	PSC Complaint #	DEF Category	PSC Closure Code
1/7/2021	1359117E	Outage	GI-15 Outages
1/19/2021	1360493E	Lighting	GI-11 Repair Service
1/20/2021	1360566E	Outage	GI-15 Outages
1/25/2021	1361105E	Outage	GI-15 Outages
2/1/2021	1361704E	Outage	GI-15 Outages
2/9/2021	1362836C	Lighting	GI-11 Repair Service
3/8/2021	1364849E	Outage	GI-15 Outages
4/12/2021	1366664E	Outage	GI-15 Outages
4/12/2021	1366672E	Outage	GI-15 Outages
4/12/2021	1366689E	Outage	GI-15 Outages
4/12/2021	1366687E	Outage	GI-15 Outages
4/15/2021	1366926E	Outage	GI-15 Outages
4/21/2021	1367195E	Outage	GI-15 Outages
5/7/2021	1368075E	Lighting	GI-11 Repair Service
5/10/2021	1368094E	Outage	GI-15 Outages
5/21/2021	1368744E	Outage	GI-15 Outages
5/28/2021	1369260E	Outage	GI-15 Outages
6/1/2021	1369323E	Voltage Problems	GI-15 Outages
6/4/2021	1369611E	Equipment/Facilities Issues	GI-17 Safety Issues
6/28/2021	1372743E	Outage	GI-15 Outages
7/6/2021	1373353E	Outage	GI-15 Outages
7/13/2021	1373981E	Vegetation Management Distribution	GI-18 Tree Trimming
7/14/2021	1374128E	Outage	GI-15 Outages
7/16/2021	1374348E	Outage	GI-15 Outages
7/19/2021	1374522E	Equipment/Facilities Issues	GI-11 Repair Service
7/21/2021	1374720E	Outage	GI-15 Outages
7/23/2021	1374851E	Outage	GI-15 Outages
7/26/2021	1374875E	Outage	GI-15 Outages
7/26/2021	1374905E	Equipment/Facilities Issues	GI-11 Repair Service
7/28/2021	1375152E	Outage	GI-15 Outages
7/28/2021	1375188E	Outage	GI-15 Outages
8/3/2021	1375442E	Outage	GI-15 Outages
8/9/2021	1375874E	Outage	GI-15 Outages
8/10/2021	1376094E	Equipment/Facilities Issues	GI-11 Repair Service

8/3/2021	1375442E	Outage	Non-Infraction	GI-15 Outages
8/9/2021	1375874E	Outage	Non-Infraction	GI-15 Outages
8/10/2021	1376094E	Equipment/Facilities Issues	Non-Infraction	GI-11 Repair Service
8/17/2021	1376746E	Outage	Non-Infraction	GI-15 Outages
8/23/2021	1377166E	Equipment/Facilities Issues	Non-Infraction	GI-30 Quality of Service
8/26/2021	1377408E	Outage	Infraction	ES-27 Did Not Provide Full and Accurate Report
9/1/2021	1377867E	Equipment/Facilities Issues	Non-Infraction	GI-11 Repair Service
9/3/2021	1377960E	Equipment/Facilities Issues	Non-Infraction	GI-11 Repair Service
9/9/2021	1378394E	Equipment/Facilities Issues	Non-Infraction	GI-11 Repair Service
9/9/2021	1378453E	Outage	Non-Infraction	GI-15 Outages
9/13/2021	1378701E	Outage	Non-Infraction	GI-15 Outages
9/13/2021	1378816E	Outage	Non-Infraction	GI-15 Outages
9/14/2021	1378906E	Outage	Non-Infraction	GI-15 Outages
9/15/2021	1379086E	Outage	Non-Infraction	GI-15 Outages
9/16/2021	1379248E	Equipment/Facilities Issues	Non-Infraction	GI-30 Quality of Service
9/30/2021	1381183E	Equipment/Facilities Issues	Non-Infraction	GI-11 Repair Service
10/4/2021	1381303E	Outage	Non-Infraction	GI-15 Outages
10/5/2021	1381420E	Outage	Non-Infraction	GI-15 Outages
10/14/2021	1382118E	Equipment/Facilities Issues	Non-Infraction	GI-30 Quality of Service
10/29/2021	1383024E	Voltage Problems	Non-Infraction	GI-15 Outages
11/15/2021	1383774E	Equipment/Facilities Issues		
11/17/2021	1383965E	Outage	Non-Infraction	GI-15 Outages
11/19/2021	1384157E	Equipment/Facilities Issues		
11/22/2021	1384190E	Equipment/Facilities Issues		
11/22/2021	1384191E	Equipment/Facilities Issues	Non-Infraction	GI-30 Quality of Service
11/22/2021	1384194E	Equipment/Facilities Issues	Non-Infraction	GI-11 Repair Service
12/8/2021	1385027E	Equipment/Facilities Issues		
12/13/2021	1385244E	Lighting		
12/28/2021	1386037E	Vegetation Management Distribution		

8/17/2021	1376746E	Outage	GI-15 Outages
9/1/2021	1377867E	Equipment/Facilities Issues	GI-11 Repair Service
9/3/2021	1377960E	Equipment/Facilities Issues	GI-11 Repair Service
9/9/2021	1378394E	Equipment/Facilities Issues	GI-11 Repair Service
9/9/2021	1378453E	Outage	GI-15 Outages
9/13/2021	1378701E	Outage	GI-15 Outages
9/13/2021	1378816E	Outage	GI-15 Outages
9/14/2021	1378906E	Outage	GI-15 Outages
9/15/2021	1379086E	Outage	GI-15 Outages
9/30/2021	1381183E	Equipment/Facilities Issues	GI-11 Repair Service
10/4/2021	1381303E	Outage	GI-15 Outages
10/5/2021	1381420E	Outage	GI-15 Outages
10/29/2021	1383024E	Voltage Problems	GI-15 Outages
11/17/2021	1383965E	Outage	GI-15 Outages
11/22/2021	1384194E	Equipment/Facilities Issues	GI-11 Repair Service

ATTACHMENT I

Storm Hardening Projects 2019-2021

Zone	Op Center	County	Project	Sub Category	Project Status or Year to Complete
South Central	Winter Garden	Orange	Oakland Ave Feeder Tie	Feeder Tie	Completed 2019
South Coastal	St Petersburg	Pinellas	16th St. X43/X46 4/0 copper to 795 AAC reconductor	Feeder Tie	Planned for 2020 Completion
South Central	Highlands	Highlands	US 27 & Hammock Rd	Feeder Tie	Planned for 2020 Completion
South Central	Highlands	Highlands	US 27 & Lakeview Rd Phase II	Feeder Tie	Completed 2019
South Central	Highlands	Highlands	State HWY 66 Phase I	Feeder Tie	Completed 2019
South Central	Highlands	Highlands	State HWY 66 Phase II	Feeder Tie	Planned for 2021 Completion
South Central	Highlands	Highlands	Lakewood Ave	Feeder Tie	Planned for 2020 Completion
North Coastal	Ocala	Marion	Ocala - SE 64th Ave Rd	Feeder Tie	Completed 2019
North Coastal	Monticello	Taylor	Perry North N15 - Reconductor	Feeder Tie	Completed 2019
South Coastal	Seven Springs	Pasco	Denham C151_Denham C152 Feeder Tie	Feeder Tie	Planned for 2021 Completion
North Coastal	Monticello	Alachua	High Springs A16	Deteriorated Conductor	Completed 2019
North Coastal	Monticello	Columbia	Ft White A20, West US 27 Reconductor	Feeder Tie/Deteriorated Conductor	Planned for 2020 Completion
South Central	Buena Vista	Orange	Hunters CK_Town Ctr Feeder Tie	Feeder Tie	Planned for 2021 Completion
South Central	Lake Wales	Polk	K9 & K5078 Feeder Tie	Feeder Tie	Completed 2019
North Coastal	Inverness	Citrus	Storm Hardening UG Xfmrs at Sportsman Riverside Townhouses, Homosass	Submersible UG	Completed 2019
North Coastal	Inverness	Citrus	Storm Hardening Gasparilla Cay Subdivision	Submersible UG	Completed 2019
North Coastal	Inverness	Citrus	Storm Hardening along Riverhaven Dr., Homosassa	Submersible UG	Completed 2019
North Coastal	Inverness	Citrus	Storm Hardening Dixie Shores Subdivision, Crystal River.	Submersible UG	Planned for 2020 Completion
North Coastal	Inverness	Citrus	Storm Hardening Blue River Cove Subdivision, Homosassa	Submersible UG	Completed 2019
South Coastal	Seven Springs	Pasco	Anclote Substation Bank 7 and Bank 8 Feeder Ties	Feeder Tie	Planned for 2020 Completion
South Central	SE Orlando	Orange	GreenTree & Cypress Glenn Grid Strenghtening - Phase 1	OH to UG Conversion	Completed 2019
South Central	SE Orlando	Orange	GreenTree & Cypress Glenn Grid Strenghtening - Phase 2	OH to UG Conversion	Planned for 2020 Completion
North Coastal	Inverness	Hernando	Storm Hardening Imperial Estates Underground	Submersible UG	Completed 2019
South Central	Highlands	Highlands	Lake Byrd Reconductor	Deteriorated Conductor	Planned for 2021 Completion
North Coastal	Monticello	Alachua	GE Alachua A186, UF Dairy Reconductor	Deteriorated Conductor	Planned for 2021 Completion
South Coastal	Zephyrhills	Pasco	Branchline reconductor at Otis Allen and 16th St.	Deteriorated Conductor	Planned for 2021 Completion
South Central	Lake Wales	Polk	Alturas Loop Rd	Deteriorated Conductor	Planned for 2021 Completion
South Central	Highlands	Highlands	K542 Sebring Airport Terminal	Deteriorated Conductor	Planned for 2021 Completion
North Central	Deland	Volusia	W902 Shaw Lake Reconductor	Deteriorated Conductor	Completed 2019
South Central	SE Orlando	Orange	Dawn Drive 5081648-2	Deteriorated Conductor	Completed 2019
North Coastal	Inverness	Citrus	Citrus Springs - Construct 3 phs 1/0 along Academy Dr & 69kv R/W and eliminate backlot line feeds.	Backlot to Frontlot Conversion	Planned for 2021 Completion
North Central	Longwood	Seminole	Fern Park M908 Grid Strenghtening	OH to UG Conversion	Planned for 2021 Completion
South Coastal	Clearwater	Pinellas	Clearwater C15 Country Club Subdivision	Deteriorated Conductor	Planned for 2021 Completion
South Coastal	Seven Springs	Pinellas	Curlew C4988 Spanish Acres Subdivision	Deteriorated Conductor	Project Cancelled. Now under TUG
South Central	Winter Garden	Orange	Main Street Feeder Tie	Feeder Tie	Planned for 2021 Completion
South Central	Buena Vista	Orange	Summerlake Park Feeder Tie K1111 to K1110	Feeder Tie	Planned for 2020 Completion
North Central	Apopka	Seminole	M109 Smoke Rise Blvd Reliability	OH to UG Conversion/ Backlot Conversion	Planned for 2021 Completion
North Central	Apopka	Orange	M34 Dudley Ave Underground Conversion	OH to UG Conversion	Planned for 2021 Completion
South Coastal	Seven Springs	Pinellas	Tarpon Springs C305 Magnolia Heights Reconductor	Feeder Tie	Planned for 2021 Completion
South Coastal	St Petersburg	Pinellas	52nd St Reconductor	Feeder Tie	Planned for 2021 Completion
South Central	Winter Garden	Orange	SR408 Crossing West of Good Homes	Overhead Line Crossing/Backlot	Planned for 2021 Completion
South Central	Clermont	Lake	Hancock Road Feeder Tie K4833_K4841	Feeder Tie	Planned for 2021 Completion
South Central	SE Orlando	Orange	Meadow Woods S Feeder Tie K1789_K1775	Feeder Tie	Planned for 2021 Completion
North Coastal	Monticello	Gulf	Feeder N55 tie to rest of Port St Joe Feeders	Feeder Tie	Planned for 2021 Completion
South Central	Buena Vista	Orange	TUG 442313600 Winwood Way	TUG	Planned for 2020 Completion
North Central	Jamestown	Orange	TUG 444365498 Lake Pickett	TUG	Completed 2019
South Coastal	Clearwater	Pinellas	TUG 444175916 KENT PL	TUG	Completed 2019
South Coastal	Seven Springs	Pasco	TUG 445908443 US HWY 19	TUG	Completed 2019
South Coastal	Walsingham	Pinellas	TUG 444000345 WALSINGHAM ROAD	TUG	Completed 2019
South Central	Lake Wales	Polk	TUG 443456879 MASTERPIECE ROAD	TUG	Completed 2019
South Coastal	Clearwater	Pinellas	TUG 444175903 LAKE AVENUE	TUG	Completed 2019
North Coastal	Monticello	Jefferson	TUG 442991482 DILLS RD	TUG	Completed 2019
North Coastal	Monticello	Jefferson	TUG 442991979 CLARK RD	TUG	Completed 2019
North Coastal	Monticello	Jefferson	TUG 442992222 DILLS RD	TUG	Completed 2019
North Coastal	Monticello	Jefferson	TUG 442991596 E CAPPS HWY	TUG	Completed 2019
North Coastal	Monticello	Jefferson	TUG 442992262 WAUKEENAH HWY	TUG	Completed 2019
North Coastal	Monticello	Jefferson	TUG 442992343 E WASHINGTON ST	TUG	Completed 2019
North Coastal	Monticello	Jefferson	TUG 442991942 E WASHINGTON ST	TUG	Completed 2019
North Coastal	Monticello	Jefferson	TUG 442992071 E WASHINGTON ST	TUG	Completed 2019
South Central	Lake Wales	Polk	TUG 443588618 W CENTRAL AVENUE	TUG	Completed 2019
South Central	Lake Wales	Polk	TUG 443590662 WAVERLY ROAD	TUG	Completed 2019
South Coastal	Walsingham	Pinellas	TUG 444000839 PARK BLVD	TUG	Completed 2019
South Central	Lake Wales	Polk	TUG 443456476 S 4TH STREET	TUG	Completed 2019
South Coastal	St Petersburg	Pinellas	TUG 443021560 13TH AVENUE SOUTH	TUG	Completed 2019
North Coastal	Monticello	Hamilton	TUG 437462847 SW 41 HWY	TUG	Completed 2019
North Coastal	Monticello	Jefferson	TUG 442991852 WAUKEENAH HWY	TUG	Completed 2019
North Coastal	Monticello	Madison	TUG 446863601 S STATE ROAD 53	TUG	Completed 2019
North Coastal	Monticello	Taylor	TUG 437643458 Johnson Stripling Rd	TUG	Completed 2019
North Central	Deland	Volusia	TUG 443101071 S WOODLAND BLVD	TUG	Completed 2019
North Coastal	Monticello	Levy	TUG 437808024 SE 4 ST	TUG	Completed 2019
North Coastal	Monticello	Taylor	TUG 437643315 MORGAN WHIDDON RD	TUG	Completed 2019
North Coastal	Monticello	Levy	TUG 437808132 OLD FANNIN RD	TUG	Completed 2019
North Central	Deland	Volusia	TUG 443101171 E TAYLOR ROAD	TUG	Completed 2019
North Coastal	Inverness	Hernando	TUG 446551406 CORTEZ BLVD	TUG	Completed 2019
North Coastal	Inverness	Hernando	TUG 446551579 OAKDALE AVENUE	TUG	Planned for 2020 Completion
North Central	Deland	Volusia	TUG 443098247 MERCERS FERNERY ROAD	TUG	Completed 2019
North Coastal	Inverness	Citrus	TUG 446947221 N CAROLWOOD PT	TUG	Completed 2019
South Central	Clermont	Lake	TUG 439153957 OLD HWY 50	TUG	Completed 2019
North Coastal	Inverness	Citrus	TUG 446948589 N.FOREST LAKE DR	TUG	Completed 2019
North Coastal	Inverness	Hernando	TUG 446551410 SINGER LANE	TUG	Completed 2019
North Coastal	Inverness	Hernando	TUG 446551438 KOLLAR STREET	TUG	Completed 2019
North Coastal	Inverness	Hernando	TUG 446551561 CEDAR LANE	TUG	Completed 2019
North Central	Deland	Volusia	TUG 443098221 W WASHINGTON AVE	TUG	Completed 2019
South Coastal	Walsingham	Pinellas	TUG 444121088 US HWY 19 N	TUG	Completed 2019
North Coastal	Inverness	Hernando	TUG 446551401 BROAD STREET	TUG	Completed 2019
North Coastal	Inverness	Hernando	TUG 446551571 PONCE DE LEON BLVD	TUG	Completed 2019
North Coastal	Inverness	Citrus	TUG 410077868 NE 9TH AVENUE	TUG	Completed 2019
North Central	Deland	Volusia	TUG 443098818 CHURCH STREET	TUG	Completed 2019
North Coastal	Inverness	Marion	TUG 446792563 SW HWY 484	TUG	Completed 2019
North Coastal	Inverness	Marion	TUG 446792833 S US HWY 41	TUG	Completed 2019
North Coastal	Inverness	Hernando	TUG 446550669 GARDEN STREET	TUG	Completed 2019
North Coastal	Inverness	Citrus	TUG 440373184 W FORT ISLAND TRAIL	TUG	Completed 2019
North Coastal	Inverness	Citrus	TUG 446947915 NORVELL BRYANT HWY	TUG	Completed 2019
North Coastal	Inverness	Hernando	TUG 446550461 BELL AVENUE	TUG	Completed 2019
North Coastal	Inverness	Citrus	TUG 446946957 S RUSSELL ROAD	TUG	Completed 2019
North Coastal	Inverness	Citrus	TUG 446946764 S JUNEAU POINT	TUG	Completed 2019
North Coastal	Inverness	Hernando	TUG 446551358 SPRING HILL DR	TUG	Completed 2019
North Coastal	Monticello	Taylor	TUG 437643271 Johnson Stripling Rd	TUG	Completed 2019
North Coastal	Monticello	Madison	TUG 446928406 NE County Road 255	TUG	Completed 2019
North Coastal	Inverness	Citrus	TUG 446946878 S. SCARBORO AVENUE	TUG	Completed 2019
North Coastal	Inverness	Hernando	TUG 446551368 AYERS ROAD	TUG	Completed 2019
North Coastal	Ocala	Marion	TUG 446640224 NE 21ST CT	TUG	Completed 2019
North Coastal	Ocala	Marion	TUG 446639397 E HIGHWAY 329	TUG	Completed 2019
North Coastal	Monticello	Madison	TUG 446928171 NE State Road 6	TUG	Completed 2019
South Coastal	Clearwater	Pinellas	TUG 444040631 McMullen Booth Rd	TUG	Completed 2019
North Central	Deland	Volusia	TUG 443101562 REYNOLDS ROAD	TUG	Completed 2019

North Central	Longwood	Orange	TUG 442901716 DR LOVE DR	TUG	Completed 2019
North Coastal	Monticello	Jefferson	TUG 442991535 Jefferson Heights Rd	TUG	Completed 2019
North Coastal	Monticello	Jefferson	TUG 442991614 BONNET POND RD	TUG	Completed 2019
North Central	Longwood	Seminole	TUG 442900787 KOKOMO LOOP	TUG	Completed 2019
North Coastal	Inverness	Hernando	TUG 446550619 W JEFFERSON STREET	TUG	Completed 2019
South Coastal	Zephyrhills	Pasco	TUG 444106863 3RD AVENUE	TUG	Completed 2019
North Central	Deland	Volusia	TUG 443098179 S HAYDEN RD	TUG	Completed 2019
North Coastal	Monticello	Lafayette	TUG 445194353 NE CRAWFORD ST	TUG	Completed 2019
North Coastal	Monticello	Jefferson	TUG 442991878 N. Jefferson St	TUG	Completed 2019
North Coastal	Monticello	Jefferson	TUG 442992412 N. Jefferson St	TUG	Completed 2019
North Coastal	Monticello	Jefferson	TUG 442992444 WILLIAM FLOYD RD	TUG	Completed 2019
North Central	Longwood	Orange	TUG 442726346 INDIANA AVENUE	TUG	Planned for 2020 Completion
North Coastal	Inverness	Citrus	TUG 446793174 E BRADFORD LANE	TUG	Completed 2019
North Coastal	Monticello	Lafayette	TUG 445194165 E MAIN ST	TUG	Completed 2019
North Coastal	Inverness	Citrus	TUG 440372700 W. HALLS RIVER ROAD	TUG	Completed 2019
North Central	Deland	Volusia	TUG 442972314 MILLS COURT	TUG	Completed 2019
South Coastal	Seven Springs	Pasco	TUG 445971300 BAZSULY CT	TUG	Completed 2019
North Coastal	Monticello	Madison	TUG 446928362 E. US Highway 90	TUG	Completed 2019
North Coastal	Inverness	Hernando	TUG 446550648 ROOSEVELT AVENUE	TUG	Completed 2020
North Coastal	Monticello	Madison	TUG 446928127 NE COLIN KELLY HWY	TUG	Completed 2019
North Coastal	Monticello	Madison	TUG 446928477 E. US Highway 90	TUG	Completed 2019
North Central	Deland	Volusia	TUG 442972575 RAINTREE CIRCLE	TUG	Completed 2019
North Coastal	Monticello	Levy	TUG 442992069 Nash Rd	TUG	Completed 2019
North Coastal	Monticello	Taylor	TUG 437643658 S. Warner Ave	TUG	Completed 2019
North Coastal	Monticello	Wakulla	TUG 446034297 Sopchoppy Hwy	TUG	Completed 2019
North Coastal	Inverness	Citrus	TUG 440372992 N CARLEEN TERRACE	TUG	Completed 2019
North Central	Deland	Volusia	TUG 442972886 MARSH ROAD	TUG	Completed 2019
North Coastal	Monticello	Jefferson	TUG 442991542 Indian Hills Rd	TUG	Completed 2019
North Coastal	Monticello	Jefferson	TUG 442992157 Indian Hills Rd	TUG	Completed 2019
North Coastal	Monticello	Wakulla	TUG 446133723 PORT LEON DR	TUG	Completed 2019
North Coastal	Ocala	Sumter	TUG 442170847 CR 567	TUG	Completed 2019
North Coastal	Monticello	Taylor	TUG 437643566 JOHNSON STRIPLING RD	TUG	Completed 2019
North Coastal	Ocala	Sumter	TUG 442171308 N US HWY 301	TUG	Completed 2019
North Coastal	Monticello	Jefferson	TUG 442992140 E. Capps Hwy	TUG	Completed 2019
North Coastal	Monticello	Jefferson	TUG 442992370 BOSTON HWY	TUG	Completed 2019
North Coastal	Ocala	Marion	TUG 446639202 NW 75TH AVE	TUG	Completed 2019
North Coastal	Inverness	Citrus	TUG 446948748 E. OLIVE LANE	TUG	Completed 2019
North Coastal	Inverness	Citrus	TUG 446948512 N TRUCKS AVENUE	TUG	Completed 2019
South Coastal	Seven Springs	Pinellas	TUG 445909816 ORANGE ST	TUG	Completed 2019
North Coastal	Monticello	Wakulla	TUG 446034704 Rock Rd	TUG	Completed 2019
South Coastal	Walsingham	Pinellas	TUG 444000493 80TH AVENUE NORTH	TUG	Completed 2019
South Coastal	Clearwater	Pinellas	TUG 444176622 MARIVA AVENUE	TUG	Planned for 2020 Completion
North Coastal	Ocala	Marion	TUG 443823907 SE 117TH PLACE	TUG	Completed 2019
South Coastal	Walsingham	Pinellas	TUG 444121839 S BELCHER RD	TUG	Completed 2019
North Central	Deland	Volusia	TUG 443101583 HAMILTON AVENUE	TUG	Completed 2019
North Coastal	Ocala	Marion	TUG 446637870 NE 180TH ST	TUG	Completed 2019
North Coastal	Monticello	Hamilton	TUG 437462945 11TH ST SE	TUG	Completed 2019
North Coastal	Monticello	Taylor	TUG 446034419 Bay Dr	TUG	Planned for 2020 Completion
South Central	Buena Vista	Orange	TUG 442314118 PARK AVE	TUG	Completed 2019
North Coastal	Monticello	Wakulla	TUG 446034948 Woodville Hwy	TUG	Completed 2019
North Coastal	Monticello	Taylor	TUG 437643670 N. Helen St	TUG	Completed 2019
South Coastal	Walsingham	Pinellas	TUG 444120484 67TH AVENUE	TUG	Completed 2019
South Central	Apopka	Orange	TUG 445664480 ROUND LAKE RD	TUG	Planned for 2020 Completion
South Central	Lake Wales	Polk	TUG 443590177 Edward Ave	TUG	Completed 2020
North Coastal	Monticello	Taylor	TUG 437643278 N. Allen St	TUG	Completed 2019
North Coastal	Inverness	Hernando	TUG 446550431 RAILROAD PLACE	TUG	Completed 2019
North Central	JAMESTOWN	ORANGE	TUG 444231047 Chuluota Rd	TUG	Completed 2019
South Coastal	Zephyrhills	Pasco	TUG 444253097 RYALS RD	TUG	Completed 2019
North Central	Jamestown	Seminole/Orange	Self- Optimizing Grid Team 401	SOG	Completed 2019
North Central	Jamestown	Seminole/Orange	Self- Optimizing Grid Team 411	SOG	Completed 2019
North Central	Deland	Volusia	Self- Optimizing Grid Team 424	SOG	Completed 2019
South Coastal	Clearwater	Pinellas	Self- Optimizing Grid Team 514	SOG	Completed 2019
South Central	Winter Garden	Orange	Self- Optimizing Grid Team 426	SOG	Completed 2019
South Central	Lake Wales	Polk	Self- Optimizing Grid Team 402	SOG	Planned for 2020 Completion
North Central	Deland	Volusia	Self- Optimizing Grid Team 403	SOG	Completed 2019
North Coastal	Monticello	Frankin/Wakulla	Self- Optimizng Grid Team 505	SOG	Planned for 2020 Completion
North Central	Apopka	Orange	Self- Optimizing Grid Team 412	SOG	Completed 2019
North Central	Longwood	Seminole	Self- Optimizing Grid Team 406	SOG	Completed 2019
South Central	Lake Wales	Polk	Self- Optimizing Grid Team 413	SOG	Completed 2019
South Central	Highlands	Highlands	Self- Optimizing Grid Team 408	SOG	Completed 2019
South Coastal	St Petersburg	Pinellas	Self- Optimizing Grid Team 521	SOG	Planned for 2020 Completion
North Central	Jamestown	Orange	Self- Optimizing Grid Team 407	SOG	Planned for 2020 Completion
North Central	Jamestown	Orange	Self- Optimizing Grid Team 434	SOG	Planned for 2020 Completion
North Coastal	Ocala	Marion	Self- Optimizing Grid Team 527	SOG	Planned for 2020 Completion
South Central	Buena Vista	Polk/Osceola	Self- Optimizing Grid Team 427	SOG	Planned for 2020 Completion
North Central	Deland	Volusia	W902- Pierson-Seville Grid Strengthening Project	Deteriorated Conductor	Planned for 2020 Completion
North Coastal	Ocala	Marion	A202- Zuber- Country Rd 326 Grid Strengthening Project	Deteriorated Conductor	Completed 2019
South Coastal	Clearwater	Pinellas	C104- Dunedin High and Highlander park Grid Strengtening Project	Deteriorated Conductor	Planned for 2020 Completion
South Central	SE Orlando	Orange	W392- Seminole Drive & Nela Ave Grid Strengtening Project	Deteriorated Conductor	Planned for 2020 Completion
South Central	Winter Garden	Orange	M342 Meadowbrook Ave	Deteriorated Conductor	Planned for 2020 Completion
North Central	Deland	Volusia	W4564 El Dorado Dr	Deteriorated Conductor	Completed 2019
North Central	Apopka	Lake	M1517 S Fish Camp Rd	Deteriorated Conductor	Planned for 2020 Completion
North Central	Apopka	Orange	M707 W Highland Ave	Deteriorated Conductor	Completed 2019
South Central	Buena Vista	Osceola	K881 North Goodman Rd	Deteriorated Conductor	Completed 2019
South Central	Lake Wales	Polk	K8 Horseshoe Creek Rd	Deteriorated Conductor	Completed 2019
North Central	Apopka	Orange	M0554 Ustler Rd	Deteriorated Conductor	Completed 2019
South Central	Lake Wales	Polk	K3245 Water Tank Rd	Deteriorated Conductor	Planned for 2020 Completion
North Central	Deland	Volusia	W1703 S Blue Lake Ave	Deteriorated Conductor	Completed 2019
North Central	Jamestown	Orange	W0250 Murdock Blvd	Deteriorated Conductor	Completed 2020
North Central	Deland	Volusia	W0382 S Stone St	Deteriorated Conductor	Planned for 2020 Completion
North Central	Apopka	Orange	M417 Pine St	Deteriorated Conductor	Completed 2019
North Coastal	Ocala	Marion	A51 134th Ave Micanopy	Deteriorated Conductor	Planned for 2020 Completion
North Central	Deland	Volusia	W4561 S Leavitt Ave	Deteriorated Conductor	Completed 2019
North Central	Deland	Volusia	W4556 Dogwood Ave	Deteriorated Conductor	Completed 2019
North Central	Apopka	Orange	M723 E Cleveland St	Deteriorated Conductor	Planned for 2020 Completion
North Central	Deland	Volusia	W1109 N Amelia Ave	Deteriorated Conductor	Completed 2019
North Central	Deland	Volusia	W1110 S Virginia Ave	Deteriorated Conductor	Planned for 2020 Completion
North Central	Apopka	Orange	M402 Grace St	Deteriorated Conductor	Planned for 2020 Completion
North Central	Apopka	Orange	M33 Zellwood M33 Duda Rd	Deteriorated Conductor	Planned for 2020 Completion
South Coastal	Seven Springs	Pinellas	C303 N Spring Blvd & Pampas Ave	Deteriorated Conductor	Planned for 2020 Completion
North Central	Apopka	Lake	M1518 Harbor Shores	Deteriorated Conductor	Planned for 2020 Completion
North Central	Apopka	Orange	M400- West Lockhart Transformer Strengtening Project	Transformer Retrofit	Completed 2019
South Central	Buena Vista	Orange	K925- Sand Lake I-Drive Transformer Strengthening Project	Transformer Retrofit	Completed 2019
South Central	Highlands	Polk	K3205- North Fort Meade Transformer Strengtening Project	Transformer Retrofit	Completed 2019
North Central	Apopka	Lake	M580 - Tavares East Transformer Strengthening Project	Transformer Retrofit	Planned for 2020 Completion
North Central	Apopka	Seminole	M1709 - Douglas Ave Transformer Strengthening Project	Transformer Retrofit	Completed 2019
North Central	Apopka	Lake	M1054 - Eustis South Transformer Strengthening Project	Transformer Retrofit	Planned for 2020 Completion
North Central	Apopka	Orange	M33 - Zellwood Transformer Strengthening Project	Transformer Retrofit	Planned for 2020 Completion
North Central	Apopka	Seminole	M476 - Piedmont Transformer Strengthening Project	Transformer Retrofit	Planned for 2020 Completion

South Central	Buena Vista	Polk	K425 - Westridge Transformer Strengthening Project	Transformer Retrofit	Completed 2020
South Central	SE Orlando	Orange	W0494 - Central Park Transformer Strengthening Project	Transformer Retrofit	Completed 2019
South Central	SE Orlando	Osceola	W0629 - Holopaw Transformer Stregthening Project	Transformer Retrofit	Planned for 2020 Completion
South Central	SE Orlando	Osceola	W0630 - Holopaw Transformer Strengthening Project	Transformer Retrofit	Completed 2020
South Central	SE Orlando	Orange	W0500 - Central Park Transformer Strengthening Project	Transformer Retrofit	Planned for 2020 Completion
South Central	SE Orlando	Orange	K1024 - Taft Transformer Strenthening Project	Transformer Retrofit	Planned for 2020 Completion
South Central	SE Orlando	Orange	K1025 - Taft Transformer Strengthening Project	Transformer Retrofit	Planned for 2020 Completion
South Central	SE Orlando	Osceola	W0105 - Canoe Creek Transformer Strengthening Project	Transformer Retrofit	Planned for 2020 Completion
North Central	Longwood	Orange	M81 - Transformer Strengthening Project	Transformer Retrofit	Planned for 2020 Completion
South Central	Highlands	Highlands	K1684 - Dinner Lake Transformer Strengthening Project	Transformer Retrofit	Planned for 2020 Completion
South Central	Highlands	Polk	K171 - Fort Meade Transformer Strengthening Project	Transformer Retrofit	Completed 2019
North Coastal	Inverness	Citrus	A271 - Homosassa Transformer Strengtheing Project	Transformer Retrofit	Completed 2019
North Coastal	Inverness	Marion	A112 - Ross Prairie Transformer Strengthening Project	Transformer Retrofit	Completed 2019
South Central	Buena Vista	Orange	K1411 - Four Corners Transformer Strengthening Project	Transformer Retrofit	Planned for 2020 Completion
South Central	Lake Wales	Osceola	K1614 - Cabbage Island Transformer Strengthening Project	Transformer Retrofit	Completed 2019
South Central	Lake Wales	Polk	K1196 - Babson Park Transformer Strengthening Project	Transformer Retrofit	Completed 2019
South Central	Lake Wales	Polk	K1195 - Babson Park Transformer Strenghtening Project	Transformer Retrofit	Planned for 2020 Completion
South Central	Lake Wales	Polk	K19 - Haines City Transfomer Strengthening Project	Transformer Retrofit	Planned for 2020 Completion
North Central	Deland	Volusia	W1107 - Deland East Transformer Strengthening Project	Transformer Retrofit	Planned for 2020 Completion
North Central	Longwood	Seminole	M662 - Spring Lake Transformer Strengthening Project	Transformer Retrofit	Planned for 2020 Completion
North Central	Longwood	Seminole	M145 - Longwood Transformer Strengthening Project	Transformer Retrofit	Planned for 2020 Completion
North Central	Longwood	Seminole	M659 - Myrtle Lake Transformer Strengthening Project	Transformer Retrofit	Completed 2019
North Central	Longwood	Orange	M1137 - Eatonville Transformer Strengthening Project	Transformer Retrofit	Planned for 2020 Completion
North Coastal	Monticello	Gulf	N201 - Port St.Joe Ind. Transformer Strengthening Project	Transformer Retrofit	Completed 2019
North Coastal	Monticello	Gulf	N55 - Port St. Joe Transformer Strengthening Project	Transformer Retrofit	Completed 2019
North Coastal	Monticello	Alachua	A144 - Alachua Transformer Strengthening Project	Transformer Retrofit	Completed 2019
North Coastal	Monticello	Taylor	N7 - Perry Transformer Strengthening Project	Transformer Retrofit	Planned for 2020 Completion
North Coastal	Monticello	Taylor	N14- Perry Northwest Transformer Strengthening Project	Transformer Retrofit	Completed 2019
North Coastal	Monticello	Taylor	N8 - Perry Transformer Strengthening Project	Transformer Retrofit	Planned for 2020 Completion
North Coastal	Monticello	Suwannee	A192 - Luraville Transformer Strengthening Project	Transformer Retrofit	Planned for 2020 Completion
North Coastal	Monticello	Columbia	A20 - Fort White Transformer Strengthening Project	Transformer Retrofit	Planned for 2020 Completion
North Coastal	Monticello	Jefferson	N67 - Monticello Transformer Strengthening Project	Transformer Retrofit	Planned for 2020 Completion
North Coastal	Monticello	Jefferson	N66 - Monticello Transformer Strengthening Project	Transformer Retrofit	Planned for 2020 Completion
North Coastal	Monticello	Alachua	A186 - GE Alachua Transformer Strengthening Project	Transformer Retrofit	Planned for 2020 Completion
North Coastal	Monticello	Jefferson	N69 - Monticello Transformer Strengthening Project	Transformer Retrofit	Planned for 2020 Completion
North Coastal	Ocala	Marion	A128 - Silver Springs Shores Transformer Strengthening Project	Transformer Retrofit	Completed 2019
North Coastal	Monticello	Jefferson	N69 - Monticello Transformer Strengthening Project	Transformer Retrofit	Planned for 2020 Completion
North Coastal	Ocala	Marion	A128 - Silver Springs Shores Transformer Strengthening Project	Transformer Retrofit	Completed 2019
South Coastal	St Petersburg	Pinellas	X265 - Central Plaza Transformer Strengthening Project	Transformer Retrofit	Planned for 2020 Completion
South Coastal	St. Petersburg	Pinellas	X282 - Northeast Transformer Strengthening Project	Transformer Retrofit	Completed 2019
South Coastal	Walsingham	Pinellas	J114 - Starkey Transformer Strengthening Project	Transformer Retrofit	Planned for 2020 Completion
South Coastal	Walsingham	Pinellas	X123 - Gateway Transformer Strengthening Project	Transformer Retrofit	Completed 2019
South Central	Winter Garden	Orange	M339 - Clarcona Transformer Strengthening Project	Transformer Retrofit	Planned for 2020 Completion
South Central	Buena Vista	Orange	Live front to Deadfron+C60:C84t Switchgear Replacement- 6418272	Switchgear Replacement	Completed 2019
South Central	Buena Vista	Orange	Live front to Deadfront Switchgear Replacement- 8003405	Switchgear Replacement	Planned for 2021 completion
South Central	Buena Vista	Orange	Live front to Deadfront Switchgear Replacement- 8003486 (K4051/K4050)	Switchgear Replacement	Completed 2019
South Central	Buena Vista	Osceola	Live front to Deadfront Switchgear Replacement 8012875	Switchgear Replacement	Completed 2019
South Central	Buena Vista	Osceola	Live front to Deadfront Switchgear Replacement 8012876	Switchgear Replacement	Completed 2019
South Central	Buena Vista	Orange	Live front to Deadfront Switchgear Replacement 8012911	Switchgear Replacement	Completed 2019
South Central	Buena Vista	Orange	Live front to Deadfront Switchgear Replacement 7837709	Switchgear Replacement	Completed 2019
South Central	Buena Vista	Orange	Live front to Deadfront Switchgear Replacement 7989918	Switchgear Replacement	Completed 2019
South Central	Buena Vista	Orange	Live front to Deadfront Switchgear Replacement 7837708	Switchgear Replacement	Completed 2019
South Central	SEO	Orange	Live front to Deadfront Switchgear Replacement W95249	Switchgear Replacement	Completed 2019
South Coastal	Clearwater	Pinellas	Live front to Deadfront Switchgear Replacement 6346731	Switchgear Replacement	Completed 2019
South Coastal	Clearwater	Pinellas	Live front to Deadfront Switchgear Replacement 7823366	Switchgear Replacement	Completed 2020
South Coastal	Seven Springs	Pasco	Live front to Deadfront Switchgear Replacement 6524810	Switchgear Replacement	Completed 2019
North Coastal	Inverness	Citrus	Live front to Deadfront Switchgear Replacement 8006311	Switchgear Replacement	Planned for 2020 Completion
North Coastal	Inverness	Marion	Live front to Deadfront Switchgear Replacement 8012466	Switchgear Replacement	Planned for 2020 Completion
North Coastal	Inverness	Citrus	Live front to Deadfront Switchgear Replacement 6524812	Switchgear Replacement	Planned for 2020 Completion
North Coastal	Inverness	Citrus	Live front to Deadfront Switchgear Replacement 6164434	Switchgear Replacement	Planned for 2020 Completion
North Coastal	Inverness	Citrus	Live front to Deadfront Switchgear Replacement 8006321	Switchgear Replacement	Planned for 2020 Completion
North Coastal	Ocala	Sumter	Live front to Deadfront Switchgear Replacement 8012605	Switchgear Replacement	Planned for 2020 Completion
North Central	Apopka	Orange	Live front to Deadfront Switchgear Replacement 6709265	Switchgear Replacement	Completed 2019
North Central	Apopka	Orange	Live front to Deadfront Switchgear Replacement 6487590	Switchgear Replacement	Completed 2019
North Central	Jamestown	Orange	Live front to Deadfront Switchgear Replacement 8012155	Switchgear Replacement	Completed 2019
North Central	Jamestown	Orange	Live front to Deadfront Switchgear Replacement 8012147	Switchgear Replacement	Planned for 2020 Completion
North Central	Jamestown	Orange	Live front to Deadfront Switchgear Replacement 8012153	Switchgear Replacement	Completed 2019
North Central	Jamestown	Orange	Live front to Deadfront Switchgear Replacement 6858455	Switchgear Replacement	Planned for 2020 Completion
North Central	Jamestown	Orange	Live front to Deadfront Switchgear Replacement 6096748	Switchgear Replacement	Completed 2019
North Central	Jamestown	Orange	Live front to Deadfront Switchgear Replacement 6096738	Switchgear Replacement	Planned for 2020 completion
North Central	Jamestown	Orange	Live front to Deadfront Switchgear Replacement 8012164	Switchgear Replacement	Completed 2019
North Central	Jamestown	Orange	Live front to Deadfront Switchgear Replacement 6096737	Switchgear Replacement	Completed 2019
North Central	Jamestown	Orange	Live front to Deadfront Switchgear Replacement 6173451	Switchgear Replacement	Completed 2019
North Central	Jamestown	Orange	Live front to Deadfront Switchgear Replacement 8011899	Switchgear Replacement	Completed 2019
South Central	Winter Garden	Orange	Live front to Deadfront Switchgear Replacement 8012720	Switchgear Replacement	Completed 2019
South Central	Winter Garden	Orange	Live front to Deadfront Switchgear Replacement 8012721	Switchgear Replacement	Completed 2019
South Central	Winter Garden	Orange	Live front to Deadfront Switchgear Replacement 8012753	Switchgear Replacement	Completed 2019
North Coastal	Ocala	Lake	Live front to Deadfront Switchgear Replacement 8012609	Switchgear Replacement	Completed 2019
North Central	Jamestown	Orange	Live front to Deadfront Switchgear Replacement 6221394	Switchgear Replacement	Completed 2019
South Central	Winter Garden	Orange	Live front to Deadfront Switchgear Replacement 8012920	Switchgear Replacement	Planned for 2020 Completion

ATTACHMENT J

I. Introduction:

Rule 25-6.0342, Florida Administrative Code, requires investor-owned electric utilities in Florida to file a Storm Hardening Plan with the Florida Public Service Commission ("FPSC") no later than 90 days after the effective date of the rule, and every 3 years as a matter of course. Rule 25-6.0342 specifies what must be included in utility storm hardening plans, and Duke Energy Florida ("DEF") has tracked those rule provisions in its Storm Hardening Plan below:

25-6.0342(3): *Each utility storm hardening plan shall contain a detailed description of the construction standards, policies, and procedures employed to enhance the reliability of overhead and underground electrical transmission and distribution facilities.*

DEF's construction standards, policies, practices, and procedures related to storm hardening issues are listed below and are attached hereto as **Attachment A**:

Distribution Standards Manual

i. General Overhead section
    1. *Details Florida's extreme wind contour lines.*
    2. *Discusses the use of the Pole Foreman program.*
    3. *Details Florida's extreme wind contour lines.*
    4. *Discusses the use of the Pole Foreman program.*
ii. Addresses NESC adherence standards
iii. Poles, Guys and Anchors Section
    1. *Discusses DEF's standard pole strengths, sizes, and limitations*
iv. Primary Construction section
    1. *Discusses corporate practices for primary line construction.*
v. Coastal and Contaminated area section
    1. *Discusses corporate practices for primary line construction in coastal areas.*
vi. Underground General Section

1. *Discusses location of UG facilities in accessible locations.*

vii. OH-UG Transition section

1. *Discusses corporate practices for primary framing on dip poles.*

viii. Trenching and Conduit section

1. *Discusses corporate practices for trenching and use of conduit on primary UG circuits.*

ix. Flooding and Storm Surge Requirements

1. *Discusses corporate procedures for the installation of UG equipment in areas targeted for storm surge hardening.*

Joint Use – Pole Attachment Guidelines and Clearances

x. Pole Attachment Guidelines

1. *Addresses Pole Attachment and Overlash Procedures.*
2. *Addresses Joint Use Construction.*
3. *Addresses Guys and Anchors.*

xi. Joint Use Clearances

1. *Addresses Line Clearances.*
2. *Addresses Joint Use Clearances.*

Distribution Engineering Manual

xii. Overhead Design guide section

1. *Addresses line location in accessible location.*
2. *Addresses NESC compliance.*
3. *Discusses Pole Foreman program.*

xiii. Underground Design guide section

1. *Addresses line location in accessible location.*
2. *Addresses NESC compliance.*

Transmission - Extreme Wind Loading Design Criteria Guideline for Overhead Transmission Line Structures

xiv. Standards Position Statement

1. *Addresses NESC compliance.*

2. *Addresses American Society of Civil Engineer's Manual 74 (ACSE 74).*
3. *Discusses transmission line importance for reliability.*
4. *Details Florida's extreme wind contour lines.*

Transmission - Line Engineering Design Philosophy

xv. Overhead Line Design philosophy

1. *Addresses NESC compliance.*
2. *Addresses insulator loading criteria.*
3. *Addresses guy / anchor capacity ratings.*
4. *Addresses design load cases.*
5. *Addresses extreme wind guidelines.*
6. *Addresses structural guidelines.*

In addition to the standards, practices, policies, and procedures identified above, DEF's Wood Pole Inspection Plan, Vegetation Management Plan, and Storm Hardening Plan, all contain standards, practices, policies, and procedures that address system reliability and issues related to extreme weather events. These plans are included herewith as **Attachment B**. In the recent years DEF has enhanced the standards to allow for better reliability, shorten restoration time and lower cost of construction. Some of these enhancements include increase the Basic Insulation Level (BIL) of new construction by increasing spacing between conductors, and increasing the insulators from 15kV to 25kV. Increasing the BIL lowers the opportunity of flashovers and outages due to vegetation crossing phases. DEF has also changed from using wood cross arms to fiberglass cross arms which allow for longevity and less chances of failure during storm due to the stronger material and not rotting due to weather. Duke Energy has also rolled these standards changes enterprise wide to lower cost and allow faster restoration when line techs from other Duke Energy jurisdictions respond to storm restoration in another area as they are familiar with the construction. DEF continuously monitors changes to NESC standards and meets and exceeds those standards as they are adopted in FL.

25-6.0342(3)(a): *Each filing shall, at a minimum, address the extent to which the utility's storm hardening plan complies, at a minimum, with the National Electric Safety Code that is applicable pursuant to subsection 25-6.0345(2), F.A.C.*

All standards, practices, policies, and procedures in the manuals and plans listed above are based on accepted industry practices designed to meet or exceed the requirements of the National Electric Safety Code (NESC). These standards, practices, policies, and procedures are followed on all new construction and all rebuilding and relocations of existing facilities.

25-6.0342(3)(b): *Each filing shall, at a minimum, address the extent to which the utility's storm hardening plan adopts the extreme wind loading standards specified by Figure 250-2(d) of the 2007 edition of the NESC for new construction, major planned work, and critical infrastructure.*

New Construction:

With respect to new construction for transmission poles, DEF's transmission department is building all new construction with either steel or concrete pole material. Virtually all new transmission structures exceed a height of sixty feet above ground and therefore will be constructed using the NESC Extreme Wind Loading criteria.

DEF's design standards can be summarized as: 1) quality construction in adherence with current NESC requirements 2) well defined and consistently executed maintenance plans, and 3) prudent end-of-life equipment replacement programs. When these elements are coupled with a sound and practiced emergency response plan, construction grades as defined by the NESC provide the best balance between cost and performance.

DEF has extensive experience with the performance of Grade C and Grade B construction standards as defined by the NESC. That experience, which includes several hurricane seasons and other severe weather events, indicates that properly constructed and maintained distribution lines meeting all provisions of the NESC perform satisfactorily and provide a prudent and responsible balance between cost and performance.

DEF has not adopted extreme wind standards for all new distribution construction because of the following reasons:

1. Section 250C of the 2007 version of the NESC does not call for the extreme wind design standard for distribution poles which are less than sixty feet in height. Because DEF's distribution poles are less than sixty feet, the extreme wind standard outlined in figure 250-2(d) does not apply.
2. All credible research, which includes extensive studies by the NESC rules committee, demonstrates that applying extreme winds standards would not benefit distribution poles. See Exhibit 4 filed in Docket No. 060172-EU, August 31, 2006 Workshop.
3. Utility experience from around the country further indicates that electrical distribution structures less than sixty feet in height are damaged in extreme wind events by trees, tree limbs, and other flying debris. Thus, applying the extreme wind standard to distribution poles would result in large increases in cost and design complexity without a commensurate benefit.
4. DEF's experience was consistent with that of the other utilities around the nation who found that vegetation and flying debris were the main causes of distribution pole damage, a condition that the extreme wind standard will not address. During Hurricane Irma at least 72% of DEF's pole failures had vegetation involved.

Major planned work:

Consistent with NESC Rule 250C, DEF will use the extreme wind standard for all major planned transmission work, including expansions, rebuilds, and relocations of existing facilities. For the reasons discussed in the new construction section above, DEF has not adopted the extreme wind standard for major planned distribution work, including expansions, rebuilds, or relocations of existing facilities.

Critical infrastructure:

With respect to transmission, virtually all new transmission structures exceed a height of sixty feet above ground and therefore are constructed using the NESC extreme wind loading criteria. Accordingly, Duke will use the extreme wind standard for all major planned transmission work, including expansions, rebuilds, and relocations of existing facilities, irrespective of whether they can be classified as "critical" or "major."

DEF, for the reasons discussed in the new construction section above, has not adopted the extreme wind standard for any of its distribution level critical infrastructure. Placing distribution poles constructed to extreme wind standards around facilities such as hospitals and police stations in DEF's service territory would unnecessarily increase costs and restoration time if those poles are knocked down by falling trees or flying debris such as roofs or signs. DEF's current level of construction, around critical facilities and around all other facilities, has performed well during weather events. DEF Transmission storm hardening initiatives proved effective in that there were no storm hardened structure failures during the 2017 and 2018 Hurricanes that hit Florida.

While no current data or research supports the application of the extreme wind standard to distribution pole construction, DEF is analyzing the extreme wind standard by using its prioritization model for implementation purposes in selected locations throughout its service territory. In conjunction with wind measuring devices, DEF will study the performance of the extreme wind standard at these various sites when a weather event allows for such analysis. From this process, DEF expects to continue to learn and adjust its extreme weather strategy based on information that it will collect and gather from other utilities in Florida and throughout the nation as new standards and applications are applied and tested. After Hurricane Michael, ten Storm Hardened projects – including an Extreme Wind pilot project - were forensically assessed. No broken poles were identified on the Cape San Blas Extreme Wind project; similar results were observed on the other nine projects with only four total broken poles. Several poles along the coastline were leaning badly as a result of the beach shoring and road infrastructure being washed out. Overall, the portions of the system that were Storm Hardened performed well during Hurricane Michael and there was no evidence that Extreme Wind was significantly better than the other project types.

25-6.0342(3)(c): *Each filing shall, at a minimum, address the extent to which the utility's storm hardening plan is designed to mitigate damage to underground and supporting overhead transmission and distribution facilities due to flooding and storm surges.*

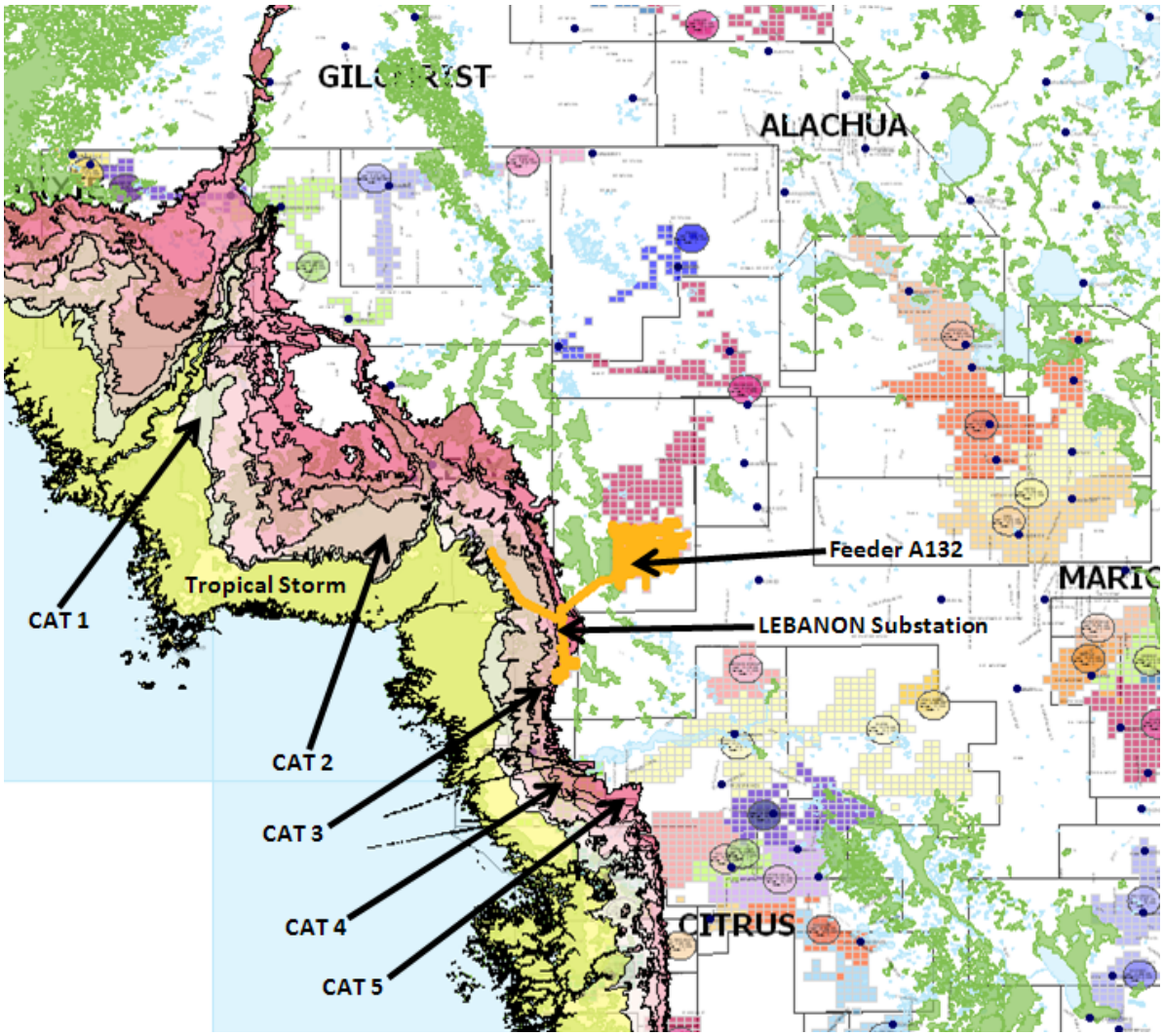
In areas where underground equipment may be exposed to minor storm surge and/or

shorter-term water intrusion, DEF has used its prioritization model (discussed in detail below) to identify areas where certain mitigation projects will be put into place to test whether flood mitigation techniques and devices can be used to protect equipment such as switchgears, pad mounted transformers and pedestals. In these selected project sites, DEF will test:

- Stainless steel equipment;
- Submersible connectors;
- Raised mounting boxes;
- Cold shrink sealing tubes; and
- Submersible secondary blocks.

Throughout the year after a significant weather event, DEF will monitor these installations to collect and analyze data to determine how this equipment performs relative to DEF's current design with respect to outage prevention, reduced maintenance, and reduced restoration times. From this process, DEF will continue to learn and will adapt its flood and storm surge strategies based on information that it will collect and based on the information gathered by other utilities in Florida and throughout the nation as new standards and applications are applied and tested.

DEF now utilizes ESRI's ArcGIS software to determine the optimum location for submersible underground facilities. The flood zones were provided by the state and overlaid onto DEF's land base computer system along with other facilities. This method allows DEF to visually determine which geographic areas would most benefit from submersible facilities. See example below.



In addition to the actions discussed above, during major storm events, substations that are in the forecast strike zone will be assessed, if the conditions exist, will have appropriate modes of protection strategically placed around substations/control houses. Those modes of protection include but are not limited to sand bagging, dam-systems, and other flood substation protection equipment. Mobile substations are utilized where applicable to assist restoration.

25-6.0342(3)(d): *Each filing shall, at a minimum, address the extent to which the utility's storm hardening plan provides for the placement of new and replacement distribution facilities so as to facilitate safe and efficient access for installation and maintenance pursuant to Rule 25-6.0341, F.A.C.*

DEF will continue to use front lot construction for all new distribution facilities and all replacement distribution facilities unless a specific operational, safety, or other site-specific reason exists for not using such construction at a given location. See Distribution Engineering Manual, Page 3.

25-6.0342(4): *Each utility storm hardening plan shall explain the systematic approach the utility will follow to achieve the desired objectives of enhancing reliability and reducing restoration costs and outage times associated with extreme weather events.*

As part of its systematic approach to storm hardening for the 2007-2009 Storm Hardening plan, DEF engaged industry expert Davies Consulting ("DCI") in developing a comprehensive prioritization model that has helped Duke identify potential hardening projects, procedures, and strategies. DCI has worked with a number of utilities nationally to evaluate their power delivery system major storm preparedness. They have also evaluated options for infrastructure hardening to improve performance and reliability not only day-to-day, but also during major storms. Collaborating with DCI, DEF created an evaluation framework for various hardening options and prioritization of potential alternatives. Since 2007, the model has been improved and enhanced to better reflect the changes in DEF's overall storm hardening strategy. New software technology such as ESRI's ArcGIS will be incorporated into the model. As more data becomes available, DEF will continue to adjust its prioritization model as appropriate.

Using a similar evaluation framework for the 2019-2021 Storm Hardening plan, DEF prioritized its proposed projects based on various components that will be discussed in more detail below.

Under the foregoing components of the evaluation framework, the prioritization model is set up to analyze the following hardening alternatives for DEF:

DEF continues to invest in proactive system maintenance activities to improve the reliability and integrity of the system. DEF announced a $25B investment (at the enterprise level) in the grid over 10 years as part of the Grid Investment Plan (GIP). DEF has begun this project in 2018 with programs including the Self-Optimizing Grid, Deteriorated Conductor, Transformer Retrofit and Targeted Underground. These programs are discussed in detail below.

- Targeted Underground Program

  The primary purpose of this hardening activity is to attempt to eliminate tree and debris related outages in the area of exposure by converting heavily vegetated neighborhoods prone to power outages from overhead to underground construction to decrease outages, reduce momentary interruptions, improve major storm restoration time, improve customer satisfaction and reduce costs.

- Deteriorated Conductor Program
  - The primary purpose of this hardening activity is to replace over dutied overhead conductor on the system that is prone to outages due to its brittle composition, small load capacity and poor connection qualities. The GIP focuses on eliminating the small copper conductor with aluminum conductor to improve the overall reliability.

- Transformer Retrofit Program
  - The primary purpose of this hardening activity is to retrofit Completely-Self Protected (CSP) transformers to be locally fused. This work stream corrects common transformer reliability conditions by replacing aged or problematic fuse cutouts and adding fuses where they previously did not exist with more reliable equipment and bringing all associated transformer equipment up to current Duke Energy construction standards. CSP transformers that have not been retrofitted have been a frequent cause of upstream fuse outages. Once retrofitted these transformers would limit the number of customers impacted by transformer or service level issues. This outage mitigation will be accomplished by adding external fused cutouts, replacing bare copper wires with covered copper, and adding animal mitigation to these locations. The retrofitting of CSP transformers is being done in lieu of replacement as a cost-effective method of outage reduction for DEF customers in these locations.

- Self-Optimizing Grid Program

- The primary purpose of this hardening activity is to strategically utilize automated switching device (ASDs) and an automation program to isolate faults on the electric distribution system and automatically reconfigure the system to minimize the number of customers that experience sustained power outages. The Self-Optimizing Grid (SOG) program will transform the radial distribution system into an automated distribution network that provides:
  1) connectivity with automated switching,
  2) capacity on the circuits to allow most circuits to be restored from alternate sources,
  3) automated control with SCADA-enable ASDs to isolate faults and reconfigure the system and
  4) segmentation such that the distribution circuits have much smaller line segments, thus reducing the number of customers that are affected by outages.

- Live Front Switchgear Replacement Program
  - The primary purpose of this hardening activity is to replace aged Live Front Switchgear prior to failure. A switchgear is a pad mounted metal enclosure that contains switches and fuses used for switching underground circuits and underground fault isolation. This program will improve overall reliability, result in faster outage restoration and improve safety for those working in the switchgears.

Base programs include:

DEF continues to invest in proactive system maintenance activities to improve the reliability and integrity of the system. DEF is continuing its normal maintenance and reliability improvements through the following programs discussed in detail below:

- Backlot to Frontlot Conversion
  - Taking an existing overhead line located in the rear of a customer's property and relocating it to the front of the customers property. This involves the removal of the existing line in the rear of the property and construction of a new line in the front of the property along with re-

routing service drops to individual customer meters. The primary purpose of this hardening activity is to minimize the number of tree exposures to the line to prevent outages and to expedite the restoration process by allowing faster access in the event an outage occurs.

- Deteriorated Conductor
  - The primary purpose of this hardening activity is similar to the GIP program listed above but targets all over-dutied overhead conductor not just copper.
- Submersible UG
  - Taking an existing UG line and equipment and hardening it to withstand a storm surge via the use of the current DEF storm surge standards. This involves the use of specialized stainless-steel equipment and submersible connections. The primary purpose of this hardening activity is to attempt to minimize the damage caused by a storm surge to the equipment and thus expedite the restoration after the storm surge has receded.
- Feeder ties
  - Tying radial feeders together to provide switching capabilities to reduce outage duration. This hardening alternative will mitigate long outages that would have otherwise occurred as a result of the inability to transfer load/customers to an alternate source.

Although the concept of storm hardening is generally thought of as outage prevention, it is inevitable that outages will still occur during a severe storm as a result of, for example, vegetation and flying debris. Feeder ties will help mitigate the duration of such outages. Tying multiple feeders together will give DEF the ability to minimize duration by serving customers from an alternate source while repairs are being made on the affected segment. Based on DEF's experience in the 2004 -2005 hurricane seasons as well as the recent tropical storms and hurricanes, feeder ties are crucial for a distribution system as it provides the opportunity to maximize the number of customers restored in the shortest timeframe possible. Regardless of what caused the outage during a severe storm, a radial feeder will be out for as long as it takes to make the necessary repairs. On the other hand, a feeder tie would allow DEF to restore as many customers as possible, thereby minimizing the number of customers that are without power for the length of the repair.

The development of the prioritization model begins with compiling a list of desired projects submitted by engineers and field personnel most familiar with the specific region. Each project is then evaluated based on specific criteria listed below but mainly focuses on the historical reliability data from the outage management system (OMS) to determine the locations that would improve reliability on normal days, such as reducing customer interruption and outage duration. DEF then selects a list of projects to represent a sample of the programs listed above that best represents the overall system. These projects performance will be evaluated after storms to continuously improve the reliability and performance of the entire system. DEF also looks for opportunities to enhance the system that would reduce damages during a storm and allow power to be restored quicker. Other criteria considered is as follows:

- Major Storm Outage Reduction Impact
  - Determines the potential benefits that the project provides during a major storm based on reduced damages or the ability to restore power more rapidly.
- Community Storm Impact
  - Evaluates the potential benefits that the proposed project will have on a community's ability to cope with damage.
- Third Party Impact
  - Captures complexities of proposed projects in terms of coordination with third parties such as telecommunication, Cable TV, permitting, easements, costs, etc.
- Overall Reliability
  - Captures the overall potential reliability benefits that the project provides on a day to day basis in terms of reduced customer interruptions and outage duration.
- Financial Cost
  - Provides the financial value of the proposed project based on cost per customer and cost per foot of newly installed wire/cable.

The following hardening project questions are asked when developing projects:

- How many customers are served from the upstream protective device?

- What will be the impact of this project on the restoration time during a major storm?
- At what category of hurricane is the area served by this feeder expected to flood due to storm surges?
- What is the tree density in the area served by this feeder or section?
- What level of tree damage will this project mitigate during a major storm?
- How many critical infrastructure components (lift stations, shelters, hospitals, police, etc.) does this project address?
- How valuable will the project be perceived by the community?
- What are the major obstacles/risks for completing the project? i.e. easements, permits, etc.
- What type of investment is required by joint users (telecoms and cable) to complete this project?
- What is the 3-year average number of CEMI4 customers on this feeder?
- What is the 3-year average number of CMI on this feeder?
- What is the change in the annual SAIDI that this project could result in?
- What is the change in the annual SAIFI that this project could result in?
- What is the construction cost per customer?

25-6.0342(4)(a): *A description of the facilities affected, including technical design specifications, construction standards, and construction methodologies employed.*

All of DEF's facilities are affected to some degree by the standards, policies, procedures, practices, and applications discussed throughout this document. Specific facilities are also addressed herein in detail (i.e. upgrading all transmission poles to concrete and steel, using front lot construction for all new distribution lines where possible). Technical design specifications, construction standards, and construction methodologies are specifically discussed at pages 1 through 3 of this plan and are included in **Attachments A** and **B**.

25-6.0342(4)(b): *The communities and areas within the utility's service area where the electric infrastructure improvements are to be made.*

As discussed above, all of DEF's facilities are affected to varying degrees by the standards, policies, procedures, practices, and applications discussed throughout this document. As a result, all areas of DEF's service territory are impacted by DEF's storm hardening efforts. Based on DEF's recent storm experience and/or through the prioritization model a number of projects were identified, please see **Attachment D** for the Distribution Projects completed between 2007 and 2018.

Distribution:

The list below is a sampling of the proposed 2019 – 2021 Storm Hardening projects (please note, proposed hardening projects may or may not be completed during the timeframe, based on emergent work and other factors that cannot be foreseen in advance):

Op Center	County	Project	Sub Category
Apopka	Seminole	M109 Smoke Rise Blvd Reliability	OH to UG Conversion/ Backlot Conversion
Apopka	Orange	M34 Dudley Ave Underground Conversion	OH to UG Conversion
Seven Springs	Pinellas	Tarpon Springs C305 Magnolia Heights Reconductor	Feeder Tie
St Petersburg	Pinellas	52nd St Reconductor	Feeder Tie
Seven Springs	Pasco	Anclote Substation Bank 7 and Bank 8 Feeder Ties	Feeder Tie
Winter Garden	Orange	SR408 Crossing West of Good Homes	Overhead Line Crossing/Backlot
Clermont	Lake	Hancock Road Feeder Tie K4833_K4841	Feeder Tie
SE Orlando	Orange	Meadow Woods S Feeder Tie K1789_K1775	Feeder Tie
Inverness	Citrus	Storm Hardening Gasparilla Cay Subdivision	Submersible UG
Inverness	Citrus	Storm Hardening along Riverhaven Dr., Homosassa	Submersible UG
Monticello	Gulf	Feeder N55 tie to rest of Port St Joe Feeders	Feeder Tie
Deland	Volusia	W902- Pierson-Seville Grid Strengthening Project	Deteriorated Conductor

Ocala	Marion	A202- Zuber- County Rd 326 Grid Strengthening Project	Deteriorated Conductor
Clearwater	Pinellas	C104- Dunedin High and Highlander park Grid Strengthening Project	Deteriorated Conductor
SE Orlando	Orange	W392- Seminole Drive & Nela Ave Grid Strengthening Project	Deteriorated Conductor
Apopka	Orange	M400- West Lockhart Transformer Strengthening Project	Transformer Retrofit
Buena Vista	Orange	K925- Sand Lake I-Drive Transformer Strengthening Project	Transformer Retrofit
Highlands	Polk	K3205- North Fort Meade Transformer Strengthening Project	Transformer Retrofit
Monticello	Taylor	N14- Perry Northwest Transformer Strengthening Project	Transformer Retrofit
Buena Vista	Orange	Live front to Deadfront Switchgear Replacement- 6418272	Switchgear Replacement
Buena Vista	Orange	Live front to Deadfront Switchgear Replacement- 8003405	Switchgear Replacement
Buena Vista	Orange	Live front to Deadfront Switchgear Replacement- 8003486 (K4051/K4050)	Switchgear Replacement
Jamestown	Orange	Self- Optimizing Grid Team 407	SOG
Highlands	Highlands	Self- Optimizing Grid Team 408	SOG
Apopka	Orange	Self- Optimizing Grid Team 412	SOG
Monticello	Franklin/ Wakulla	Self- Optimizing Grid Team 505	SOG
Buena Vista	Orange	TUG 442313600 Winwood Way	TUG
Monticello	Jefferson	TUG 442991878 Jefferson St	TUG
Inverness	Citrus	TUG 446946764 Juneau Point	TUG
Jamestown	Orange	TUG 444365498 Lake Pickett	TUG

Regarding system hardening projects in general, DEF's approach is to consider the unique circumstances of each potential location considered for hardening by taking into account variables such as:

- operating history and environment;
- community impact and customer input;
- exposure to storm surge and flooding;

- equipment condition;
- historical and forecast storm experience; and
- potential impacts on third parties;

This surgical approach leads to the best solution for each discrete segment of the delivery system.

Transmission:

The Transmission Department is employing a system-based approach to changing out wood poles to either concrete or steel poles based upon the inspection cycle and condition of pole. These projects are identified during the transmission pole inspection cycles. Specific new, rebuilt or relocated projects that are planned over the next three years are listed below:

North Florida			
Project Name	**County**	**Type**	**Third Party**
Montverde to Winter Garden - 69 kV Line Rebuild	Lake	Rebuild	Yes
American Cement to Bushnell East -	Sumter	Rebuild/New	Yes
Eustis to Dona Vista 69 kV Line Rebuild	Lake	Rebuild	Yes
Oak Tap to Havana- New Rebuild 115KV Line	Gadsden	Rebuild	Yes
Idylwild - Wacahoota Tap (SI) - Rebuild 69 kV line (Two Phases)	Alachua	Rebuild	Yes
Williston - New 230/69 kV Substati	Levy	Rebuild/New	Yes
Eustis-Eustis South (EES) 69 kV Line Rebuild	Lake	Rebuild	Yes
New Powerline Sub Replacement with	Citrus	Rebuild/New	Yes
Deland West-Dona Vista - New 230 kV	Lake	Rebuild	Yes
Ginnie-Bell Tp (IS) Rebuild_Bell -	Gilchrist	Rebuild	Yes

Shady Hills - 230kV Line	Citrus	Rebuild	Yes
Coleman to Dixie Tap - 69 kV Line Rebuild	Sumter	Rebuild	Yes
Dallas to Orange Blossom - Rebuild 69 kV Line	Sumter	Rebuild	Yes
Central Florida to Federal - 69 kV Line Rebuild	Lake	Rebuild	Yes
Fort White-Luraville 69kV Line Rebuilds	Columbia	Rebuild	Yes
Alachua Tap to Hull Road 69kV Line	Alachua	Rebuild	Yes
Nobleton Tap-(SECO) Floral City Tap	Citrus	Rebuild	Yes
Central Florida - Picciola Tap 69kV Rebuild	Lake	Rebuild	Yes
Tallahassee to Oak City TAP Rebuild	Leon	Rebuild	Yes
Suwannee Springs 115kV Switching St	Suwannee	Rebuild/New	Yes
Lake Talquin-Brickyard 69kV Rebuild dbl-ckt-capable struc	Leon	Rebuild	Yes
Andersen to Wildwood City Tap - 69 kV Line Rebuild	Sumter	Rebuild	Yes
New 115kV Suwannee Transmission Sub	Suwannee	Rebuild/New	Yes
Florida OHG (Static) Replace	Hernando	Rebuild	Yes
Crawfordville - Carrabelle Rebuild as double circuit 115kV & 69kV	Wakulla	Rebuild	Yes

Ross Prairie to Marion Oaks Tap 69 kV Line Rebuild	Marion	Rebuild	Yes
Mondon Hill - New 230/115 kV Substa	Hernando	Rebuild/New	Yes
Dunnellon Town-Rainbow Spgs Tap	Marion	Rebuild	Yes
Rainbow Spgs Tp to Rainbow Lk - Reb	Marion	Rebuild	Yes
FLUOF	Alachua	Rebuild/New	Yes
Industrial Tap - New 15 Mvar Capaci	Lake	Customer Request	Possibly
FLGOV - 230T9 - DR-85 GOAB for FDOT	Marion	Governmental	Possibly
FLGOV - 1373T6 - MS-233 & MS-234 Ro	Marion	Governmental	Possibly
FLGOV - SR 44 BAILEY BRIDGE FOR THE	Sumter	Governmental	Possibly
FLGOV - SR 528 & Landstreet Boxout	Marion	Governmental	Possibly
FLGOV Citrus County Trail aka Withlacoochee Dunnel 437349-1	Citrus	Governmental	Possibly
Coleman to Federal - 69 kV Line Rebuild	Sumter	Governmental	Yes
FLGOV MS--67-6 to MS-67-7 SR 326 a	Marion	Governmental	Possibly
FLCUST Univ of FL AUF Relocation -	Alachua	Customer Request	Yes
US-27 Road Widening - CLC-48A Stub	Lake	Governmental	Possibly

FLGOV CLC-73 69kV Fosgate Road at US 27 Lake County contains D-Line Work	Lake	Governmental	Possibly
FLGOV MS--67-6 to MS-67-7 69kV SR 326 at CR 25A- FPID 435660-2	Marion	Governmental	Possibly
Old Town North Sub to Cross City Su	Dixie	Rebuild	Yes
Brooksville West - Loop in Brookrid	Hernando	Rebuild/New	Possibly
Fort White - Replace/Upgrade 115kV	Columbia	Rebuild	Yes
Suwannee Transmission Substation 23	Suwannee	Rebuild/New	Possibly
Tallahassee - new 115 kV Yard (New	Leon	Rebuild/New	Yes
Install 230/115kV Transformer at Fo	Columbia	Rebuild/New	Possibly
TRMP GP (Buckeye) Foley Substation	Taylor	Customer Request	Yes
Florida Portfolio of Governmental P	Lake	Customer Request	Possibly
Florida Portfolio of Governmental P	Sumter	Governmental	Possibly
Florida Portfolio of Governmental P	Sumter	Customer Request	Possibly
Florida Portfolio of Governmental P	Hernando	Governmental	Possibly
Florida Portfolio of Governmental P	Lake	Governmental	Possibly
Florida Portfolio of Governmental P	Hernando	Customer Request	Possibly

Florida Portfolio of Governmental P	Marion	Governmental	Possibly

South Florida			
Project Name	**County**	**Type**	**Third Party**
60KK8D 285T9 FAIRBANKS	Orange	Customer Request	Yes
Northridge to West Davenport - New	Polk	Rebuild	Yes
TRMP-2098D1-FGT East - Relay Upgrad	Orange	Rebuild	Yes
Bithlo to UCF 69kv Line rebuild	Orange	Rebuild	Yes
West Chapman to Winter Park East 69	Seminole	Rebuild	Yes
Oviedo to Winter Springs - 69 kV Line Rebuild	Seminole	Rebuild	Yes
Wire Road - New River 230kV Line & 69kV Line Rebuild (formerly Zephyrhills)	Pasco	Rebuild/New	Yes
Rio Pinar to Econ to Winter Park East - 230 kV Line Rebuild	Orange	Rebuild	Yes
Keystone - New 230-115 kV Substatio	Pinellas	Rebuild	Yes
Gateway to 32nd Street (HD-7) - 115	Pinellas	Rebuild	Yes
40th Street to 16th Street (BFE-2) - 115 kV Line Rebuild	Pinellas	Rebuild	Yes
Bayview to East Clearwater (HD-3) - 115 kV Line Rebuild	Pinellas	Rebuild	Yes

Bayboro Site Purchase	Pinellas	Rebuild/New	Yes
North Longwood-Sylvan 230kV (NLSX);	Seminole	Rebuild	Yes
Myrtle Lake - Wekiva 230kV Line Rebuild	Seminole	Rebuild	Yes
Piedmont - Wekiva 230kV Line Rebuild	Seminole	Rebuild	Yes
Vandolah to Whidden - 230 kV Line Rebuild	Hardee	Rebuild/New	Yes
West Lake Wales to Lake Wales 69 kV	Polk	Rebuild	Yes
Continental - Loop SECO Substation	Hardee	Customer Request	Yes
TRMP Ulmerton to Tri-City - 115 kV	Pinellas	Rebuild/New	Yes
TRMP 2078 DISSTON-STARKEY RD	Pinellas	Rebuild/New	Yes
Hemple to Ocoee 69 kV Line Rebuild	Orange	Rebuild	Yes
Deleon Springs to Barberville - 115	Volusia	Rebuild	Yes
Fort Meade to West Lake Wales Line Rebuild	Polk	Rebuild	Yes
TRMP-2568 ZUBER INC CAP	Pasco	Rebuild	Yes
Gateway to Ulmerton (HD-6) - 115 kV Line Rebuild	Pinellas	Rebuild	Yes
Dry Prairie - 230/69kV Substation	Hardee	Rebuild/New	Yes

Intercession City - Rebuild Interce	Osceola	Rebuild	Yes
Lake Aloma to Winter Park East - 69	Orange	Rebuild	Yes
Conway to Pinecastle - 69 kV Line Rebuild	Orange	Rebuild	Yes
Haines City East to Poinciana 69 kV	Polk	Rebuild	Yes
Davenport to Haines City 69 kV Rebu	Polk	Rebuild	Yes
Haines City to Haines City East 69	Polk	Rebuild	Yes
FLGOV 69kV DWB-169 to 181 and DWB-127-6 SR 15 (US 17) from Ponce De Leon Boulevard to East of SR 40, FPID: 410251-1-52-0	Volusia	Governmental	Possibly
FLGOV - 305T8 - AD-18-20,63,64 Sebr	Highlands	Governmental	Possibly
FLGOV - 341T2 - AFC-12 Sebring Pkwy	Highlands	Governmental	Possibly
FLGOV - 967T4 - WR & RW 69kV Reloca	Orange	Governmental	Possibly
FLGOV - POWERLINE ICLW & HP Road Co	Polk	Governmental	Possibly
FLGOV - DWB-127-6 Str Relocation fo	Volusia	Governmental	Possibly
FLCUST - AUCF-83 Relocate for Dolla	Seminole	Customer Request	Possibly
FLGOV-AL-5 to AL-7, US 27 (SR 25) a	Polk	Governmental	Possibly
FLCUST WLB-22 to WLB-31 UNIVERSAL OH to UG Conversion	Orange	Customer Request	Possibly

Oakhurst to Seminole 69kV Rebuild	Pinellas	Rebuild	Yes
Largo to Ulmerton West 69kV Rebuild	Pinellas	Rebuild	Yes
Sky Lake to Meadow Woods South - New 230 kV Line & 69 kV Line Rebuilds	Orange	Rebuild/New	Yes
Magnolia Ranch to Moss Park -69kV L	Orange	Rebuild	yes
Celebration to Lake Wilson - 69kV L	Osceola	Rebuild	Yes
Lake Bryan to Orangewood - 69kV Lin	Orange	Rebuild	Yes
410755-2 Bayway Structures Removals	Pinellas	Governmental	Possibly
FLGOV West French Ave Pedestrian Bridge ~	Volusia	Governmental	Possibly
FLCUST BFE 52 & BFE 53 115kV DevMar	Pinellas	Customer Request	Possibly
FLGOV WO 69kV I-4 Ultimate, Wymore	Orange	Governmental	Possibly
FLGOV DWL 230kV DWL & WLLW-SR 60 R/R Overpass @ West Lake Wales Sub	Polk	Governmental	Possibly
FLGOV AL-5 to AL-7 69kV US 27 (SR 25) at SR 60- FPID 419243-4-52-01	Polk	Governmental	Possibly
FLGOV SLE 69kV Relocation for Kennedy Blvd Widening (Orange Cnty)	Orange	Governmental	Possibly
605EBD-967T4 WR &RW RELOCATION	Orange	Customer Request	Possibly
60KK8-1967T2 SLM RELO @ KEN	Orange	Customer Request	Possibly

60KK8-1967T3 WO RELO @ KEN	Orange	Customer Request	Possibly
605EBD_287T4_WF-63-77-69KV	Seminole	Customer Request	Possibly
Largo to Taylor Ave (LTW-1) 69kV Li	Pinellas	Rebuild	Yes
Belleair to Largo (LECW-1) - 69 kV Line Rebuild	Pinellas	Rebuild	Yes
Lake Bryan to Vineland - 69 kV Line rebuild	Orange	Rebuild	Yes
Keller Road - Spring Lake 69kV Line Rebuild	Seminole	Rebuild	Yes
Rio Pinar to FGT East 69kv Line Rebuild	Orange	Rebuild	Yes
Rio Pinar to Curry Ford (RX) 230 kV Line Rebuild	Orange	Rebuild	Yes
Hudson-Golden Acres-New Port Richey	Pasco	Rebuild	Yes
Fort Meade - New 69kV Terminal, Ins	Polk	Customer Request	Possibly
32nd Street - Feeder Additions and	Pinellas	Rebuild	Possibly
Pilsbury 115kV Series Reactor	Pinellas	Rebuild/New	Possibly
Bonnet Creek to Intercession City	Osceola	Rebuild	Yes
Barnum City to Westridge - 69 kV Line Rebuild	Polk	Rebuild	Yes
TRMP Bayview to Tri-City - 115 kV L	Pinellas	Rebuild/New	Yes

TRMP Winter Springs to Sanford/Poin	Seminole	Rebuild	Yes
Horse Creek Upgrades to 2,000 amps	Hardee	Customer Request	Possibly
Myrtle Lake - NLSX Rebuild	Seminole	Rebuild	Yes
Florida Portfolio of Governmental P	Seminole	Customer Request	Possibly
Florida Portfolio of Governmental P	Orange	Governmental	Possibly
Florida Portfolio of Governmental P	Pinellas	Governmental	Possibly
Florida Portfolio of Governmental P	Seminole	Customer Request	Possibly
Florida Portfolio of Governmental P	Orange	Governmental	Possibly
Florida Portfolio of Governmental P	Seminole	Customer Request	Possibly
Florida Portfolio of Governmental P	Orange	Customer Request	Possibly
Florida Portfolio of Governmental P	Pinellas	Governmental	Possibly
Florida Portfolio of Governmental P	Orange	Governmental	Possibly
Florida Portfolio of Governmental P	Seminole	Customer Request	Possibly
Florida Portfolio of Governmental P	Pinellas	Customer Request	Possibly
Florida Portfolio of Governmental P	Polk	Governmental	Possibly

Florida Portfolio of Governmental P	Orange	Governmental	Possibly
Florida Portfolio of Governmental P	Pinellas	Governmental	Possibly
Daetwyler Drive Customer Relocation	Pinellas	Customer Request	Possibly

25-6.0342(4)(c): *The extent to which the electric infrastructure improvements involve joint use facilities on which third-party attachments exist.*

In the description of specific hardening projects above, DEF has provided information as to whether the projects involve joint use facilities on which third-party attachments exist. Since 2009, all joint use poles changed out in support of Rule 25-6.0342(6) are scheduled within the company work management system. Communication carriers are notified at the time of the pole change out that transfers are needed. This process is in line with the other company pole maintenance programs and the cost to the communication carriers is minimized. DEF completed the required inspection of every joint use pole on the system in the year end of 2013, and are currently in the 7th year of the second round of inspections and anticipate completing the cycle by year end of 2020.

25-6.0342(4)(d): *An estimate of the costs and benefits to the utility of making the electric infrastructure improvements, including the effect on reducing storm restoration costs and customer outages.*

With respect to system-wide storm and extreme weather applications identified in **Attachment B**, DEF has provided any available cost/benefit information within the documents in **Attachment B**. Additionally, please see the following chart for money that DEF has spent in 2016, 2017 and 2018 on storm hardening and maintenance:

Duke Energy Florida Storm Hardening and Maintenance Costs

Description	2016 Actual	2017 Actual	2018 Actual
Vegetation Management (Distribution & Transmission)	$40,076,769	$38,691,356	$46,784,730
Joint Use Pole Inspection Audit	$438,525	$448,503	$442,367
Transmission Pole Inspections	$1,918,500	$1,242,836	$1,826,054
Other Transmission Inspections and Maintenance	$5,649,611	$5,649,691	$6,084,476
Transmission Hardening Projects	$110,436,718	$109,829,369	$185,614,179
Distribution Pole Inspections & Treatments	$3,998,798	$4,536,355	$3,992,201
Distribution Hardening Projects	$42,453,504	$41,291,401	$44,801,476
Total	**$204,972,425**	**$201,689,511**	**$244,744,007**

25-6.0342(4)(e): *An estimate of the costs and benefits, obtained pursuant to Rule 25-6.0342(6), provided to third-party attachers affected by the electric infrastructure improvements, including the effect on reducing storm restoration costs and customer outages realized by the third-party attachers.*

With respect to system-wide storm and extreme weather applications identified in **Attachments A** and **B**, DEF believes that any entity jointly attached to DEF's equipment would enjoy any benefit that DEF would enjoy from that same application, and DEF has provided any available cost/benefit information within the documents in those attachments.

25-6.0342(5): *Each utility shall maintain written safety, reliability, pole loading capacity, and engineering standards and procedures for attachments by others.*

Please see **Attachment A** and **Attachment C**.

25-6.0342(5): *The attachment standards and procedures shall meet or exceed the NESC so as to assure that third-party facilities do not impair electric safety, adequacy, or*

pole reliability; do not exceed pole loading capacity; and are constructed, installed, maintained, and operated in accordance with generally accepted engineering practices for the utility's service territory.

All third-party joint use attachments on Duke Energy Florida's distribution and transmission poles are engineered and designed to meet or exceed current NESC clearance and wind loading standards. New attachment requests are field inspected before and after attachments to assure company construction standards are being met. All entities proposing to attach joint use attachments to Duke Energy Florida's distribution and transmission poles are given a copy of the company-prepared "Joint Use Attachment Guidelines." Attached hereto as **Attachment C**. These guidelines are a comprehensive collection of information spelling out the company's joint use process, construction standards, timelines, financial responsibilities, and key company contacts responsible for the completing permit requests. All newly proposed joint use attachments are field checked and designed using generally accepted engineering practices to assure the new attachments do not overload the pole or impact safety or reliability of the electric or other attachments. Additionally, annual and full-system audits are performed as detailed in DEF's annual March 1 comprehensive reliability report. For details on this activity, please see **Attachment B**.

25-6.0342(6): *Each utility shall seek input from and attempt in good faith to accommodate concerns raised by other entities with existing agreements to share the use of its electric facilities.*

Since 2009, DEF has continued to communicate with the telecommunications carriers regarding the pole loading project. DEF has diligently cut cost for carriers by suggesting make ready solutions for over loaded pole conditions that do not include pole change outs. Additional guying and attachment rearrangement solutions have saved the communications carriers thousands of dollars annually. DEF continues to answer any questions and address concerns expressed verbally by joint attachers. DEF has taken all input received into consideration in the development and finalization of this storm hardening plan.

2019 Storm Hardening Plan Attachment List

Attachment A:

1. Distribution Standards Manual
2. Distribution Engineering Manual
3. Transmission Extreme Winds Loading
4. Transmission Line Engineering Design Philosophy

Attachment B:

1. Pole Inspection Plan
2. 2018 PSC Reliability Report Excerpts, pages 39-42, 44-65

Attachment C:

1. Joint Use Pole Guidelines

Attachment D:

1. DEF Storm Harding 2007-2018 Projects

ATTACHMENT K

Document title:	Document number:
Transmission Wood Structure Inspection Guidelines	TECP-MIM-TRM-00118
	Revision No.: 004
Keywords: TEEM-EE, line patrols, groundline inspection, maintenance instructional material	Applies to: Transmission – All Regions

1. Introduction

This maintenance procedure provides specific guidance for performing wood structure groundline inspections which includes any of the following; visual inspection of wood structures, site observation, hardware inspection, conductor inspection, and line switch inspection. A specific listing of lines and inspection requirements will be included in a work authorization.

The Contractor shall furnish and maintain all tools, equipment, and materials, and labor to properly inspect Duke Energy facilities as set forth in these specifications. This inspection covers both Duke Energy owned and Duke Energy leased structures.

This inspection guideline is to be utilized with Document ***TECP-MIM-TRM-00121***, Transmission Non-Wood Structure Visual Inspection Guidelines.

2. Definitions

2.1. Structure types:

2.1.1. Direct embedded wood pole

2.2. Structure configuration types:

2.2.1. Suspension/Tangent – in-line structures where line tension is continuous

2.2.2. Running Angle – structures carrying line angles where line tension remains continuous.

2.2.3. Strain structure – structures where line tension is connected to the structure through an arm or the structure itself. Strain structures are typically found at line angles, line ends, and longer crossing spans (rivers/highways/etc.)

2.2.4. Switch Structure – any structure carrying a line switch, Duke transmission switches are ganged type switches or single hook operated switches. Ganged one-way, two-way, or three-way switches either manually operated or motorized. This should be reported if requested in the work authorization.

2.2.5. H-frame structure – structure type that consists of 2 poles with one or two crossarms joining the two poles, creating a single structure.

2.3. Structure Position Identification: For multi-pole such as h-frames or three pole strains, structure identification is defined from left to right while facing line ahead. For example, facing a three-pole structure in the direction of increasing structure numbers, poles will be identified as A, B, and C from left to right. Single structures will always be identified as structure A.

2.4. Repair of Broken or Stolen Structure Grounds: Structure grounds are subject to vandalism and theft above grade. Repair of ground lead wires, if required in the work authorization, will be made by reconnecting leads. Duke Energy will provide the compression connectors and wire. The contractor is responsible for providing crimpers and any other needed tools.

2.5. Sound & Bore Patrol Requirements: In Florida, a portion of the lines to be patrolled will require three specific inspection tasks including the following; sounding, soil excavation, and boring. They are described in Sections 3.2, 3.3, and 3.4.

3. Wood Structure Inspection Requirements

3.1. Overall Site Inspection and Data Collection:

3.1.1. This section is required for ALL wood poles, regardless of regional location or structure types.

3.1.2. Prior to a structure inspection, the site is to be first assessed to ensure there is no danger from any abnormal situations such as unattached conductors, broken crossarms, broken guys, or other critical structural members that put the structure or inspector in eminent danger. Once the site is deemed safe for inspection, the structure inspection may begin.

3.1.3. Data collection items as requested in the work authorization shall be collected. Data collected may include but are not limited to the following:

3.1.3.1. Structure Type – single pole, H-frame, multiple pole, etc.

3.1.3.2. Manufacture Dates – Obtained from manufacture birthmark if readable.

3.1.3.3. Configuration of Structure – Framing type or structure type (strain/suspension/etc.)

3.1.3.4. Insulator Type – glass, porcelain, polymer, or use - strain, suspension, or post.

3.1.4. Erosion – Severe erosion or large sinkholes around the base of a structure should be noted and reported to Duke Energy. Erosion causing structure deflection or questions about structure stability should be reported immediately.

3.1.5. Standing Water – If the base of a wood structure is submerged underwater, it shall be reported to Duke Energy.

3.1.6. Grounding Connections Points - Visually inspect grounding connections; at the bottom of structure and at top of structure to the overhead static for continuity. Report loose, corroded, burned, or missing ground connections. All wood structures should have ground connecting the pole to earth.

3.1.7. Structure Numbering - Visually inspect structure signage for readability, damage, or missing structure numbers

3.1.8. Aerial Marker Balls – Some structures have aerial marker balls on them for aid in aerial patrols. If present, inspect aerial marker balls for damage and color deterioration. If the ball is broken and missing, a large bolt protruding from the wood pole below the conductors with an ~1 ft long yellow or orange guy guard around the bolt will remain and let the observer know a ball is missing.

3.2. **Pole Inspection and Sounding:**

3.2.1. This section is required for ALL wood poles, regardless of regional location.

3.2.2. Each pole shall be sounded with a waffle head type hammer thoroughly in all quadrants from groundline to 7 feet high to determine integrity and possible decay. Sounding should leave marks that are recognizable in the event of an audit. (All wood poles are to be sounded regardless of age, species, or treatment).

3.2.3. After sounding and visual inspection, the pole shall be probed with an approved probing tool or screwdriver with a blade at least 5 inches long. Probe downward through the soil into the pole, keeping continuous pressure on the tool. Probe the pole in at least four points in each quarter section of the pole, from the groundline to six inches below the ground.

3.2.4. If the decay is found below grade, soil shall be removed as necessary to aid with the testing.

3.2.5. Visually inspect the pole from groundline to top for defects, splits, or woodpecker holes.

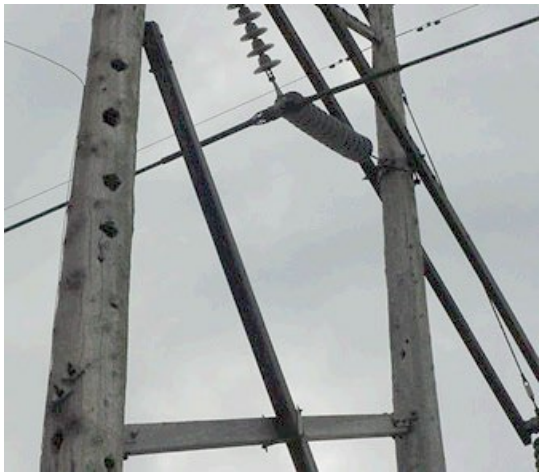
3.2.6. Poles are to be rejected if damage, decay, or shell thickness meets the criteria as defined in Section 5.0.

Priority 1 Internal Decay
(Shell thickness less than 1 inch)

Priority 1 Internal Decay
(Deep decay pocket)

Green Growth
(May be an indicator of substantial pole decay)

Priority 1 Groundline Pole Decay



Priority 1 Woodpecker holes with large internal cavities

Priority 2 Split Pole Top & Vertical Woodpecker Holes

Priority 2 Woodpecker Holes (Located in critical spots)

Priority 2 Woodpecker Holes - Quantity & orientation indicates significant decay

Priority 9 Woodpecker Holes (Not in a critical location)

Priority 9 Woodpecker Holes (Does note hold water & can be repaired)

3.3. **Soil Excavation Requirements:**

3.3.1. When soil excavation is required in the work authorization, excavation shall be completed as follows;

3.3.2. Excavation should only be initiated after it is determined that the sounding test or visual inspection up the pole does not already deem that the pole needs to be replaced.

3.3.3. Soil is to be removed around the entire pole to a depth of 12 inches. The hole shall extend at least 4 inches from the pole at the 12-inch depth and 10 inches from the pole at groundline.

3.3.4. When poles are located on lawns, the turf shall be removed with care, placed on a ground cover such as a tarp, and carefully replaced when work is completed.

3.3.5. If any sign of decay, soft wood, hollowness, or abnormal coloration is found, the pole is also to be probed or drilled with a suitable tool to ascertain the extend of the deterioration.

3.3.6. CCA poles 15 years old or less are not to be excavated unless decay is found during sounding and probing.

3.4. **Boring Requirements:**

3.4.1. When borings are required in the work authorization, they shall be completed as follows;

3.4.2. A 3/8” diameter boring shall be drilled adjacent to where the most suspected decay is found during the sounding test. If no decay is suspected, the boring shall be taken near the deepest check. If there are no checks the boring shall be taken on either side of the pole in the same direction as the line is facing. The boring shall begin pole entry at groundline, be taken at a 45-degree angle, and proceed past the center of the pole.

3.4.3. If decay pockets are detected, a minimum of two additional borings shall be taken to determine the extent of decay. Any pole with a hollow center shall have the thickness determined with a shell depth indicator.

3.4.4. All inspection holes shall be plugged with tightly fitting CCA-treated wood dowels.

4. Structure Attachment Inspection Requirements

4.1. **Transmission Line Conductors**

4.1.1. A visual inspection of all phase conductors span back and span ahead should be completed at each structure examining the following components.

4.1.1.1. Damaged or Broken Strands – Note strands that are broken, burned, shot, or physically damaged. Record the location of the damage and number of strands broken.

4.1.1.2. Foreign Objects – Note any foreign objects on the conductors such as vegetation, balloon strings, plastic, shoes, etc.

4.1.1.3. Conductor Joints – Visually inspect full tension joints and loop joints for signs of heating, flashing, missing bolts, or mechanical damage. This include compression joints and bolted terminal connections.

4.1.1.4. Conductor Clamps – Visually inspect the conductor clamps on a structure for signs of heating, mechanical damage, and fatigue. Note hardware fatigue, cotter pins missing or backing out, burns, evidence of slipping in compression joints, and missing or loosened bolts.

4.1.1.5. Tie Wires – Visually inspect tie wires on post insulators for evidence of loosening or damage. Ensure the wire is properly seated in the post groove.

4.1.1.6. Conductor Dampening Hardware – Visually inspect dampers for signs of fatigue or mechanical damage. Report loose, disconnected, or missing dampers.

4.1.1.7. Conductor Spacers – Visually inspect conductor spacers for evidence of flashing, fatigue, and mechanical damage. If broken spacers are found, particularly on “hair-pin” type spacers, examine the conductor for evidence of cutting near the break point.

Priority 1 broken “Hair-pin” with >20% broken strands. Viewed from the ground.

4.1.1.8. Line Surge Arrestors – Visually inspect line surge arrestors for cracking, deterioration, or mechanical damage. Report blown isolators, disconnected conductor or ground leads, missing or worn attachment hardware.

4.2. Insulators and Hardware

4.2.1. All phase insulators and hardware shall be visually inspected during a structure inspection. Insulators fall into two main classes – Porcelain or Glass and Polymer

4.2.2. Hardware – Visually inspect all hardware connecting an insulator to a structure and insulator to conductor clamp for signs of mechanical damage or fatigue. Metal on metal connections between shackles, U-bolts, hooks, rings, and clevises should be examined with binoculars to look for signs of material loss, melting, cutting, missing bolts and/or pull through.

Priority 0 – Failed U-bolt detached on one end.

Priority 1 – Heavily rusted hardware suspected of wearing through pin.

4.2.3. Porcelain or Glass Insulators

4.2.3.1. Visually inspect insulator strings for broken bells. Report broken bells if the minimal threshold in a string is met: 44/69kV lines – 2 or more bells broken, 100/115kV lines -3- or more broken bells: 230/345/500kV – 4 or more broken bells. Note that chipped bells do not meet the definition of broken.

4.2.3.2. Visually inspect for evidence of pin rusting. Note significant corrosion, pin narrowing, or base swelling.

4.2.3.3. Visually inspect cotter pins for backing out or missing.

4.2.3.4. Report pin type insulators mounted above a crossarm with a broken top skirt or 2 or more broken skirts in any location.

4.2.3.5. Report pin type insulators mounted above a crossarm rolled greater than 30 degrees from vertical.

4.2.4. Polymer Insulators

4.2.4.1. Polymer insulators operating at 138kV or above should have corona rings attached at the energized end. Inspect for missing or improperly installed corona rings. Note, this does not apply to line post insulators.

4.2.4.2. Visually inspect for cut sheaths or openings in the polymer around the insulator rod.

4.2.4.3. Visually inspect the energized end of the insulator for significant alligatoring or cracking. This is often accompanied by a whitening of the insulator

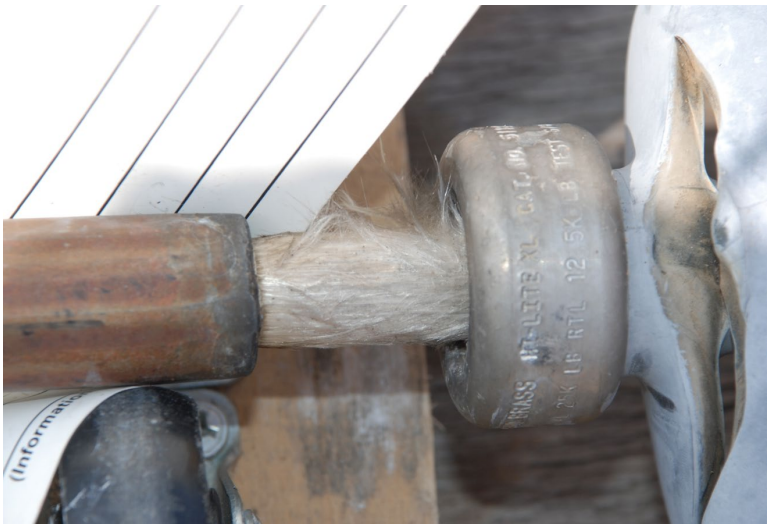
4.2.4.4. Visually inspect for any exposing of the fiberglass rod.

4.2.4.5. Visually inspect for mechanical or electrical damage resulting from tracking or flashing.

Priority 2 – Rolled pin insulator greater than 30 degrees

Priority 1 Porcelain Spark Erosion

Priority 1 “Ball and Socket” insulator pin erosion



Priority 1 Polymer with exposed fiberglass rod

Priority 1 Polymer insulator with split housing.

4.3. **Structure Guying**

4.3.1. Note conditions of structure guys and its components.

4.3.2. Guy Wire -Visually inspect the guy wire for signs of corrosion, mechanical damage, or broken strands.

4.3.3. Guy Wire Preforms – Inspect the preform for signs of wear or mechanical damage.

4.3.4. Anchor – Inspect anchor groundline interface for signs of loosening or pulling out, corrosion, or mechanical damage to the anchor rod. Guy rod eye and preform must be above ground.

4.3.5. Guy Sticks – Visually inspect fiberglass insulating stick for signs of wear, cracking, backing out or missing cotter pins.

4.3.6. Guy Grounding – Visually inspect to ensure that guys all have a continuous path to ground. Structures utilizing guy sticks should have connections between guys below forming a path to structure, typically on the guy attached to the shield wire.

4.4. **Shield Wires – OHGW & OPGW**

4.4.1. A visual inspection of OHGW and OPGW span back and span ahead should be completed at each structure examining the following components.

4.4.1.1. Damaged or Broken Strands – Note strands that are broken, burned, shot, or physically damaged. Record the location of the damage and number of strands broken.

4.4.1.2. Foreign Objects – Note any foreign objects on the conductors such as vegetation, balloon strings, plastic, shoes, etc.

4.4.1.3. Joints – Visually inspect full tension joints and loop joints for signs of heating, flashing, missing bolts, or mechanical damage. This include compression joints and bolted terminal connections.

4.4.1.4. Shield Clamps – Visually inspect the shield clamps on a structure for signs of flashing, mechanical damage, and fatigue. Note hardware fatigue, cotter pins missing or backing out, burns, evidence of slipping in compression joints, and missing or loosened bolts.

4.4.1.5. Grounding – Ensure grounding connection is intact and not damaged, disconnected, or burned.

4.4.1.6. OPGW Splice Cans – Visually inspect fiber optic splice cans for mechanical damage. Report if the splice cannister is laying on the ground.

4.5. **Line Switching Points**

4.5.1. Note the condition of line switching points.

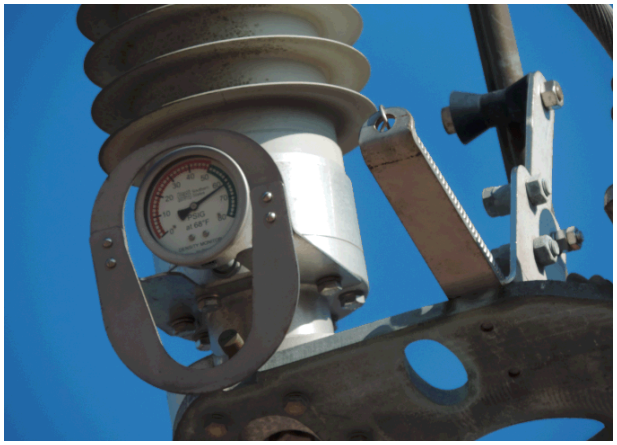
4.5.1.1. Switch Operators – Visually inspect switch operator (swing handle, crank handle, or motor operator) for signs of damage or vandalism, missing locks, or missing grounds.

4.5.1.2. Operating Pipe – Visually inspect operating pipe for signs of mechanical damage, cracking, or missing bolts.

4.5.1.3. Conductor Terminations – Visually inspect conductor terminations for signs of heating, flashing, missing bolts, or loose connections.

4.5.1.4. Line Switch Live Parts – Visually inspect switch live parts for signs of breakage, flashing, or loosening.

4.5.1.5. Line Switch Insulators – Visually inspect line switch insulators for signs of breaks or flashing.



SF6 Gas Level on Southern States must be in the Green Region

S&C Target is Normally White. Red Target Indicates Low Gas

5. Reject Criteria Priority Definitions

5.1. **Priority 0 – Emergency: All priority 0 issues shall be reported to Duke Energy immediately.**

5.1.1. Structure or equipment issues that have a significant and immediate impact on the health and safety of personnel, the environment, or the general public and require immediate attention.

5.1.2. These issues pose immediate risks to safety or system integrity.

5.1.3. Duke Energy field supervision shall be contacted, and the contractor will remain on site until Duke Energy personnel arrives and the area is secured.

5.2. **Priority 1 – Emergent:**

5.2.1. The structure or its components are deteriorated or damaged to the extent that it poses moderate probability of impacting system reliability but does not require immediate attention.

5.2.2. Structures or components require replacement in an expedited manner as defined by work management.

5.3. **Priority 2 – Routine:**

5.3.1. The structure or its components are deteriorated or damaged but pose a very low to no probability of an outage and pose no safety risks.

5.3.2. Asset needs repair or replacement and can be built into normal work schedules.

5.4. **Priority 9 – Monitoring:**

5.4.1. The structure or its components need repair or maintenance on non-critical components, however, there is no safety or reliability risk.

5.5. All work orders will be completed in accordance with the Transmission Work Management Corrective Work Process, document ADMP-ADM-TRM-00052.

5.6. Reference Appendix A in this document for table of Priority Codes.

6. Structure Tagging

6.1. All inspected poles shall be marked with an aluminum tags identifying the work performed, contractor name, inspection date.

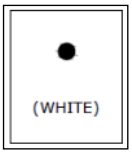
6.2. Inspection tags shall be placed five (5) feet above groundline on the side of the structure most easily seen from roads or nearby access locations. If none are present, place the tag on the birthmark side of the pole.

6.3. White tags will be used to identify only structures with damages compromising their structural integrity such as decay, deterioration, and critical damage. White tags shall not be placed on structures, for damages to insulators, hardware, conductor, or other non-structural issues.

6.4. Priority 0 reject structures do not require tagging as Duke Energy's response will be immediate.

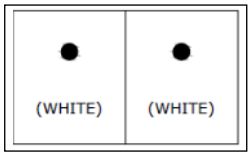
6.5. Priority 1 reject structures will be marked with **two** 1-1/2" by 1-1/2" white tags placed immediately below the inspection tag.

6.6. Priority 2 reject structures will be marked with **one** 1-1/2" by 1-1/2" white tags placed immediately below the inspection tag.



One white Tag

Inspection Tag



Two white tags

7. Quality Assurance and Quality Control

7.1. All work shall be entirely satisfactory to Duke Energy and shall be subject to inspection as required by Duke Energy.

7.2. The Contractor shall internally audit no less than 1% of all poles inspected by its inspectors. Poles are to be selected totally at random and be checked for accuracy and quality of work.

7.3. The quality control inspection shall be performed for each time period of not less than one (1) week's work but not to exceed two (2) weeks' previous work. The quality control inspection will be conducted with the Contractor's inspection supervisor and a Duke Energy representative when available.

7.4. The quality control inspection shall consist of the partial to complete re-inspection of those poles selected. The re-inspection shall include re-excavation and re-boring if those tasks were performed.

7.5. Serious errors found by Duke Energy will be brought to the attention of the Contractor. Corrective actions satisfactory to Duke Energy must be remedied before the next quality control check. The corrective action may include re-working all poles back to the previous quality control check point at no cost to Duke Energy.

7.6. Results of Contractor audits shall be communicated electronically to Duke and include the pole inspector names.

7.7. Duke Energy shall be issued a copy of the contractor quality control field report.

8. Photograph Requirements

8.1. A digital photograph is required to be taken of all defects that result in a Priority 1 or 2 rejected pole and attached to the structure's data sheet in Duke Energy's Collector application.

8.2. The photograph should be at least 1 megapixel in size resolution and be taken at a distance that clearly shows the defect but also includes as much as possible the pole and surroundings.

9. Data Collection

9.1. Data provided to the Contractor will be by electronic files in an Excel spreadsheet format.

9.2. Use of Duke Energy's Collector application will be required for inspections on the transmission system. The Collector application is a smart phone application which presents the user a map of the line they are inspecting and provides selectable forms to complete with each structure's inspection. Requirements for use of the Collector application are an iOS based smart phone with location services enabled. In addition, users of the application will need to be setup with Duke network identifications and complete required IT security forms.

9.3. Inspection contractors may also collect and provide Duke Energy with inspection data in their respective company's typical format. However, this data will not substitute as a replacement or be use in lieu of the Collector application.

9.4. Data deliverables and report requirements include but is not limited to the following;

9.4.1. Maintenance region
9.4.2. Line name, line code, and or line number
9.4.3. Structure number, including poles A, B, C, etc.
9.4.4. Structure GPS coordinates
9.4.5. Date pole inspected
9.4.6. Pole length and class
9.4.7. Pole manufacturer and birthmark date
9.4.8. Pole species
9.4.9. Type of external/internal treatments applied
9.4.10. Original/effective ground line circumference
9.4.11. Observed deficiencies and associated repair/replace priorities

9.5. Reporting Requirements

9.5.1. A summary of all poles inspected & work performed on an individual line or substation basis, including number of poles inspected, and failure rate.
9.5.2. Copies of all internal audit reports.
9.5.3. Reports are to be provided only after ALL work on a line is completed in its' entirety.
9.5.4. A weekly inspection progress schedule must be submitted to the Project Manager at the start of each week for the previous weeks work.
9.5.5. Duke Energy must be notified by email as line circuit inspections are completed to monitor timeline for end of circuit files and invoicing.
9.5.6. Invoicing and inspection reports are to be provided only after ALL work on a circuit is completed in its' entirety.
9.5.7. Invoices and end of circuit files must be sent to Duke Energy 30 days or less from time of notification of circuit inspection completion.
9.5.8. All invoicing for current year inspection program must be presented to Duke Energy for final payment no later than December 15th.

APPENDIX A

Component	Visual Inspect	Definitions of Reporting Issues Found	Priority Code
Overall Site Condition	Data Collection	Record all requested attributes - Foundation Type, Structure Material, etc.	
Overall Site Condition	Standing Water	The wood pole is permanently in standing water.	9
Wood Pole	Broken	Broken pole extremely hazardous condition for public or system reliability.	0
Wood Pole	Decay	Deterioration to the extent of pole failing, extremely hazardous condition for public or system reliability.	0
Wood Pole	Decay	Ground line internal rot, decay, or hollowness with a shell thickness of 2 inches or less is found.	1
Wood Pole	Decay	Ground line rot or decay that extends more than 2 inches into the pole along more than 1/4 of the pole circumference.	1
Wood Pole	Decay	Diameter calculations determine the pole has lost more than 50 percent of the original pole strength.	1
Wood pole	Bird hole	Woodpecker holes extend through the pole and daylight is visible.	1
Wood pole	Deflection	Longitudinal pole deflection exceeds 5 feet.	1
Wood pole	Cracking	Extensive longitudinal cracking exists through critical attachments.	1
Wood pole	Deer Stand	Deer stand attached to pole	1
Wood pole	Erosion	Earth washout at the pole base compromises the pole integrity.	1
Wood pole	Decay	Hammer test or probing at groundline reveals internal rot, decay, or hollowness with a shell thickness of 2 - 4 inches is found at any location.	2
Wood Pole	Decay	Hammer test or probing at groundline reveals rot or decay extends 3 or more inches into the pole along more than ¼ of the pole circumference.	2
Wood pole	Decay	Effective diameter calculations determine the pole has lost more than 33 percent of the original pole strength.	2
Wood Pole	Shell Cracking	Hammer test reveals significant shell cracking or soft wood, indicated by sound or caving of the wood.	2
Wood pole	Bird hole	Woodpecker holes contain extensive nesting cavities in critical locations.	2

Component	Visual Inspect	Definitions of Reporting Issues Found	Priority Code
Wood pole	Bird hole	Woodpecker holes are extensive and generally at least “softball” sized.	2
Wood pole	Decay	Pole checks up the pole reveal significant evidence of decay, insect damage, or shell separation, as indicated by caving the pole, sawdust, or sound.	2
Wood pole	Deflection	Longitudinal pole deflection is between 3 – 5 feet.	2
Wood pole	Deflection	Transverse pole deflection is more than 20 degrees.	2
Wood pole	Erosion	Earth washout the pole base requires the pole to be replaced.	2
Wood pole	Strength	Pole must meet NESC “at replacement” strength requirements, which occurs when at least 2/3 of the original required pole strength remains. This is specified in the NESC Code, Table 26101A, Footnote 2.	2
Wood pole	Bird hole	Woodpecker holes not meeting the criteria for pole replacements.	9
Crossarm	Split	Split at insulator pin, through bolt, possible immediate failure	0
Crossarm	Decay	Rot or decay, possible immediate failure	0
Crossarm	Damage	Decay, split, gunshot, burned, etc. with a moderate possibility of failing.	2
Crossarm	Loosening	Bolts loose, backed out,	1
Crossarm	X-bracing	Loose, broken, bolts missing	1
Conductor	Wire Strands	Broken strands more than 20% repair	1
Conductor	Wire Strands	Broken strands less than 20% repair	2
Conductor	Steel core	Steel core strands damaged repair	1
Conductor	Splices	Discoloration signs of burning, heating	2
Conductor	Spacers	Broken, loose, corona cutting, missing	2
Conductor	Clamps	Missing nuts, bolts, cotter pins, casting issue	2
Conductor	Hardware	Deterioration of pins, shackles, hooks, work holes, bolts nuts missing or loose	2
Conductor	Tie Wire	Loose, broken, burned, untied	1
Conductor	Switch Termination	Discoloration signs of burning, heating, bolts loose at switch pad	2
Conductor	Arrester	Blown arrester, damaged, isolator, flashed	2
Conductor	Outriggers	Tension of conductor bending of outriggers	2
Insulator	Porcelain/glass	44kv/69kv 2 or more broken units, replace	2

Component	Visual Inspect	Definitions of Reporting Issues Found	Priority Code
Insulator	Porcelain/glass	100/115kv 3 or more broken units, replace	2
Insulator	Porcelain/glass	230/345/500KV 4 or more broken units, replace	2
Insulator	Porcelain/glass/Polymer	Ball and socket type, erosion of ball shank, socket locking pin out, cotter pin missing on dead-end.	2
Insulator	Polymer	Exposed fiberglass rod	1
Insulator	Polymer	Cut, torn, punctured sheath skirt	2
Insulator	Porcelain/glass/Polymer	Heavy contamination, example bird dropping	2
Insulator	Porcelain/glass/Polymer	Moderate contamination, example bird dropping	9
Insulator	Polymer	115kv and above no corona ring	9
Insulator	Post porcelain	Broken affecting the conductor groove and possibility of failure	1
Insulator	Post porcelain	Broken skirts, cracked, flashed with minor possibility of failing	2
Insulator	Post porcelain	Broken skirts, chipped, flashed with no possibility of failing	9
Hardware	Hooks/Rings/Clevises/ U-bolts	Severe rusting and evidence of fatigue cutting of hardware supporting insulator strings	1*
Guying	Guy anchor rod	Broken	0
Guying	Guy Preform	Broken	0
Guying	Guy Wire	Broken	0
Guying	Guy Preform	Damaged, severe rust corrosion,	2
Guying	Guy Wire	Damaged, severe rust corrosion	2
Guying	Guy anchor rod	Buried below ground, Damaged, severe corrosion	2
Static/OPGW	Structure Ground Wire	Bonding point to structure is missing, loose, or damaged. (Evaluate for energization risk)	2
OPGW	Splice Can on Ground	Splice cannister laying on ground and not in enclosure on mounted on the structure.	2
Static/OPGW	Broken Strands	Broken strands more than 20% repair	1
Static/OPGW	Broken Strands	Broken strands less than 20% repair	2
Switch Terminations	Switch Live Parts	Damaged, broken parts, loose bolts, Discoloration signs of burning, heating	2
Switch Terminations	Switch Blade Position	If not in fully Closed position or Open position,	1

Component	Visual Inspect	Definitions of Reporting Issues Found	Priority Code
Switch Terminations	Interrupter bottles	Flashed, broken, burned, loose, missing parts	2
Switch Terminations	Ganged Switch Operating Pipe	Broken, loose, bend, slippage, cracked, severe rust corrosion	2
Switch Structures	Gas Indicator	Gas Indicator is red indicating low gas	2
Right of way	Encroachment	Construction, grading, building, etc. (Report to Asset Protection for follow-up)	1
Right of way	Erosion	Erosion issues that are worsening, affecting the access and stability of the line structures. (Report to Erosion & Control Specialist for Evaluation)	2
Right of way	Deer stand	Attached to structure	1
Right of way	Deer stand	Located in right of way	9
Aerial Markers	Marker Balls	Aerial Marker ball is damaged, broken, or disconnected	1

* - Insulator hardware replacements should include the entire insulator string.

Document Approval Form

issued 6/24/21

Section A: Document identification and type of action (Instructions for completing form on page 2)

Document no.: TECP-MIM-TRM-00118 | Revision no.: 004

Document title: Transmission Wood Structure Inspection Guidelines

Applies to: (Select all that apply)

- ☒ Duke Energy
- ☐ Duke Energy Carolinas, LLC
- ☐ Duke Energy Progress, LLC
- ☐ Duke Energy Florida, LLC
- ☐ Duke Energy Indiana, LLC
- ☐ Duke Energy Kentucky, Inc.
- ☐ Duke Energy Ohio, Inc.
- ☐ Group _____
- ☒ Department Transmission- ALL
- ☐ Other _____

Type of action:

- ☐ New
- ☒ Revision
- ☐ Periodic review completed
- ☐ Ownership Change
- ☐ Cancellation
- ☐ Suspension
- ☐ Renumber

Periodic Review cycle: (Default is 2-year)

- ☐ 1-Year
- ☐ 2-Year
- ☒ 3-Year
- ☐ 4-Year
- ☐ 5-Year

Compliance Applicability: (required field)

- ☐ None
- ☐ NERC
- ☐ State Codes/Standards
- ☐ FERC Standards of Conduct
- ☐ Patriot Act
- ☐ Sarbanes-Oxley
- ☐ HIPAA
- ☐ OSHA _____
- ☐ Other _____

- ☐ Communication plan established
- ☐ Impact Reviews completed

For Doc. Mgmt staff use only:

- ☐ Editorial Change
- ☐ Control element revision

_____
(does not require approval signature)

Security Restrictions Required: ☐ Yes ☒ No If yes, explain _____

Document Collection name(s): (Not Required - A unique grouping of like documents.)

Complete if submitting a form:

Does the form have a parent, governing or instructional procedure? ☐ No ☐ Yes (Procedure No: _____)

How is the form to be completed or used? ☐ Hard Copy (completed by hand) ☐ Online Data Entry (fillable PDF)

Description of document action or summary of changes:
revison: 4 added clarification of white tags use

Section B: Approval **Who should sign?** see instructions on page 2

Author(s)/Writer(s)/Preparer(s) (*signature not required*):
Tim Mosteller

Approval recommended (*print name*): Tyler Johnson	(*signature*)	Date:
Approval recommended (*print name*):	(*signature*)	Date:
Approval recommended (*print name*):	(*signature*)	Date:
Final Approval (*print name*): Andrew Adldoost	(*signature*) Digitally signed by Andrew Adldoost Date: 2021.06.22 15:09:02 -04'00'	Date:

Return signed form as a PDF to TransDocumentMgmt@duke-energy.com.

Keywords: procedures and forms; procedures program; DAF; ADMP-PRO-ADS-00002; document management program
Applies to: Duke Energy - Transmission; Enterprise Operational Excellence

Document title:	Document number:
Transmission Non-Wood Structure Visual Inspection Guidelines	TECP-MIM-TRM-00121
	Revision No.: 002
Keywords: TEEM-EE, line patrols, groundline inspection, maintenance instructional material	Applies to: Transmission – All Regions

1. Introduction

This maintenance procedure provides specific guidance for performing non wood structure groundline inspections which includes any of the following; visual inspection of non-wood structures (towers and non-wood poles), site observation, hardware inspection, conductor inspection, and line switch inspection. A specific listing of lines and inspection requirements will be included in a work authorization.

The Contractor shall furnish and maintain all tools, equipment, and materials, and labor to properly inspect Duke Energy facilities as set forth in these specifications. This inspection covers both Duke Energy owned and Duke Energy leased structures.

This inspection guideline is to be utilized with Document ***TECP-MIM-TRM-00118*****,** Transmission Wood Structure Inspection Guidelines.

2. Definitions

2.1. Structure types:

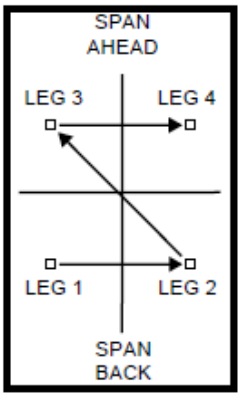
- 2.1.1. Lattice Tower – Tower made of lattice steel. May be galvanized or weathering steel.
- 2.1.2. Steel pole – refers to a directly embedded pole made of steel.
- 2.1.3. Concrete pole – refers to a directly embedded pole made of reinforced concrete
- 2.1.4. Engineered pole – refers to a custom engineered pole set on a foundation with anchor bolts. Foundation type is typically a concrete drilled pier with anchor bolts, and pole is typically steel.
- 2.1.5. Hybrid Pole – refers to a pole made of two different materials. Hybrid poles typically have a concrete bottom section embedded in the ground with a steel top section.
- 2.1.6. Other Material Types – Ductile Iron, Fiberglass, Laminated Wood

2.2. Structure configuration types:

- 2.2.1. Suspension/Tangent – in-line structures where line tension is continuous
- 2.2.2. Running Angle – structures carrying line angles where line tension remains continuous.
- 2.2.3. Strain structure – structures where line tension is connected to the structure through an arm or the structure itself. Strain structures are typically found at line angles, line ends, and longer crossing spans (rivers/highways/etc.)
- 2.2.4. Switch Structure – any structure carrying a line switch, Duke transmission switches may be one-way, two-way, or three-way switches. They may also be manually operated or motorized. This should be reported if requested in the work authorization.

2.3. Structure Position Identification: For multi-pole or multi-column structures such as h-frames or three pole strains, structure identification is defined from left to right while facing line ahead. For example, facing a three-pole structure in the direction of increasing structure numbers, poles will be identified as A, B, and C from left to right. Single structures will always be identified as structure A.

2.4. Tower Leg Position Identification: Tower legs are to be identified as 1, 2, 3, & 4, in a left to right pattern. When facing line ahead towards increasing structure numbers, the front left will be leg 1 and front right will be 2. The back left is 3, and the back right is 4.



2.5. Repair of Broken or Stolen Structure Grounds: Structure grounds are subject to vandalism and theft above grade. Repair of ground lead wires, if required in the work authorization, will be made by reconnecting leads. Duke Energy will provide the compression connectors and wire. The contractor is responsible for providing crimpers and any other needed tools.

3. Non-Wood Structure Inspection Requirements

3.1. **Overall Site Inspection and Data Collection**:

3.1.1. This section is required for ALL structures, regardless of regional location or structure type.

3.1.2. Prior to a structure inspection, the site is to be first assessed to ensure there is no danger from any abnormal situations such as unattached conductors, broken crossarms, broken guys, or other critical structural members that put the structure or inspector in eminent danger. Once the site is deemed safe for inspection, the structure inspection may begin.

3.1.3. Data collection items as requested in the work authorization shall be collected. Data collected may include but are not limited to the following:

3.1.3.1. Structure Type - lattice tower, steel pole, concrete pole, etc

3.1.3.2. Manufacture Dates – Obtained from nameplates on structures

3.1.3.3. Configuration of Structure – Framing type or structure type (strain/suspension/etc)

3.1.3.4. Insulator Type – Glass, porcelain, polymer, post

3.1.3.5. Foundation Type – Direct Embed or Drilled Pier, Direct Embed backfill types – native soil, washed stone, concrete.

3.1.4. Erosion – Severe erosion or large sinkholes around the base of a structure should be noted and reported to Duke Energy. Erosion causing structure deflection or questions about structure stability should be reported immediately.

3.1.5. Standing Water – If the base of a metallic structure is submerged underwater, it shall be reported to Duke Energy. This only applies if the metallic part of the structure is submerged, i.e. not the coatings. Towers on concrete piers in water need not be reported unless typical water levels are above the concrete pier.

3.2. Concrete Foundations

3.2.1. The interface of the foundation and structure is critically important to structure health. This section applies to all structure types, regardless of region, on a concrete foundation.

3.2.2. Visually inspect the interface of metallic material and concrete. Corrosion and material degradation should be recorded. If large sections of material loss are evident, notify Duke Energy immediately.

3.2.3. Inspect shape and condition of the concrete. A proper foundation should have a slight dome allowing water to drain from the structure/foundation interface. Report depressions or “bowls” around this interface that allow ponding of water against the metal.

3.2.4. Visually inspect for exposed rebar, spalling of concrete, cracking or mechanical damage to the foundation. Rust originating from inside a crack or cracks larger than ¼” wide should be noted.

3.2.5. Report all concrete foundations that have earthen backfill covering the top of the foundation.

Priority 2 – Concrete foundation with cracking greater than ¼”

Priority 1 – Concrete foundation with cracks greater than ¼” and exposed anchor rods

3.3. **Non-Wood Structure; Lattice Steel Towers**

3.3.1. Note conditions beginning from the ground level to the top of the structure.

3.3.2. Tower Legs - Visually inspect legs at ground line for rust and mechanical damage. If rust or damage is apparent, estimate and document extent of damage.

3.3.3. Structural Members - Visually inspect angle steel, plate steel, and channel steel for loosening, missing, damaged or corroded members. Binoculars should be used to assess the condition of any suspect members above 20 feet.

3.3.4. Bolts - Visually inspect for missing, loosening, corroded or damaged bolts. Often, listening for rattling in the structure can aid in finding loose and missing bolts.

3.3.5. Grounding Connections Points - Visually inspect grounding connections; at the bottom of structure and at top of structure to the overhead static for continuity. Report loose, corroded, burned, or missing ground connections.

3.3.6. Structure Numbering and Do Not Climb Signs - Visually inspect structure signage for readability, damage, or missing signs or structure numbers.

3.3.7. Aerial Marker Balls – Some structures have aerial marker balls on them for aid in aerial patrols. If present, inspect aerial marker balls for damage and color deterioration. If the ball is broken and missing, a large bolt protruding from the upper section of the structure with an ~1 ft long yellow or orange guy guard around the bolt will remain and let the observer know a ball is missing.

3.4. **Non-wood Structure; Steel Poles**

3.4.1. Note conditions beginning from the ground level to the top of the structure.

3.4.2. Ground Line - Visually inspect the ground line for rust, mechanical damage, or large flaking and peeling of pole coating systems.

3.4.3. Structural members - Visually inspect structural welds for splitting, cracking, or excessive corrosion. On weathering steel poles, inspect splice joints for excessive packout or weld splitting.

3.4.4. Structure arms – Visual inspect connection to pole with binoculars. Note loose or missing bolts and excessive rust. For structures with davit arms, corrosion of the interface between the arm and shaft indicates water entrapment.

3.4.5. Bolts and Nuts - Visually inspect for missing, loosening, corroded or damaged bolts and nuts.

3.4.6. Grounding Connections Points - Visually inspect grounding connections; at the bottom of structure and at top of structure to the overhead static for continuity. Report loose, corroded, burned, or missing ground connections. Note, weathering steel poles require a grounding connection at the base of a pole. Directly embedded galvanized steel poles may or may not have grounding hardware at the bottom of the pole. If not included in the work authorization, regional lines technical support can provide guidance as to whether grounding hardware at the groundline should or should not be present.

3.4.7. Weep Holes – Visually inspect weep holes to verify they are clear of clogging or blockage which prevents moisture from escaping.

3.4.8. Structure Numbering - Visually inspect structure signage for readability, damage, or missing structure numbers

3.4.9. Aerial Marker Balls – Some structures have aerial marker balls on them for aid in aerial patrols. If present, inspect aerial marker balls for damage and color deterioration. If the ball is broken and missing, a large bolt protruding from the upper section of the structure with an ~1 ft long yellow or orange guy guard around the bolt will remain and let the observer know a ball is missing.

3.5. **Non-wood Structure; Engineering Poles**

3.5.1. Note conditions beginning from the ground level to the top of the structure.

3.5.2. Ground Line – Visually inspect structural welds paying particular attention to base plate welds for splitting or cracking. Inspect anchor bolts for loosening or missing nuts, excessive corrosion, or mechanical damage.

3.5.3. Structural members - Visually inspect structural welds for splitting, cracking, or excessive corrosion. On weathering steel poles, inspect splice joints for excessive packout or weld splitting.

3.5.4. Structure arms – Visual inspect connection to pole with binoculars. Note loose or missing bolts and excessive rust. For structures with davit arms, corrosion of the interface between the arm and shaft indicates water entrapment.

3.5.5. Bolts and Nuts - Visually inspect for missing, loosening, corroded or damaged bolts and nuts.

3.5.6. Grounding Connections Points - Visually inspect grounding connections; at the bottom of structure and at top of structure to the overhead static for continuity. Report loose, corroded, burned, or missing ground connections. All engineered structures should have ground connecting the pole to earth.

3.5.7. Weep Holes – Visually inspect weep holes to verify they are clear of clogging or blockage which prevents moisture from escaping.

3.5.8. Structure Numbering - Visually inspect structure signage for readability, damage, or missing structure numbers

3.5.9. Aerial Marker Balls – Some structures have aerial marker balls on them for aid in aerial patrols. If present, inspect aerial marker balls for damage and color deterioration. If the ball is broken and missing, a large bolt protruding from the upper section of the structure with an ~1 ft long yellow or orange guy guard around the bolt will remain and let the observer know a ball is missing.

3.6. **Non-wood Structure; Concrete Poles**

3.6.1. Note conditions beginning from the ground level to the top of the structure.

3.6.2. Ground Line – Visually inspect ground line for concrete deterioration and mechanical damage.

3.6.3. Pole Integrity - Visually inspect pole surface for cracking concrete and rust stains. Report cracks over ¼” large and any cracking with rust stains originating from the crack.

3.6.4. Structure arms – Visual inspect connection to pole with binoculars. Note loose or missing bolts and excessive rust. For structures with davit arms, corrosion of the interface between the arm and shaft indicates water entrapment.

3.6.5. Bolts and Nuts - Visually inspect for missing, loosening, corroded or damaged bolts and nuts.

3.6.6. Grounding Connections Points - Visually inspect grounding connections; at the bottom of structure and at top of structure to the overhead static for continuity. Report loose, corroded, burned, or missing ground connections. All engineered structures should have ground connecting the pole to earth.

3.6.7. Structure Numbering - Visually inspect structure signage for readability, damage, or missing structure numbers

3.6.8. Aerial Marker Balls – Some structures have aerial marker balls on them for aid in aerial patrols. If present, inspect aerial marker balls for damage and color deterioration. If the ball is broken and missing, a large bolt protruding from the upper section of the structure with an ~1 ft long yellow or orange guy guard around the bolt will remain and let the observer know a ball is missing.

3.7. **Non-wood Structure: Aluminum Towers**

3.7.1. This section applies specifically to aluminum towers. These are primarily found in DEM and DEF.

3.7.2. Aluminum towers follow the same inspection guidance as listed in the Lattice Tower section with enhanced focus on the following:

3.7.2.1. Hardware deadending conductors or guys needs to be evaluated for deformation or hardware pulling through aluminum structural members.

3.7.2.2. In DEM, narrow based aluminum lattice poles, city towers, should have climbing deterrent installed approximately 15’ above grade. Report damaged or missing climbing deterrents on this specific type of structure.

3.8. **Non-wood Structure: Other Materials**

3.8.1. Structure materials not covered in the sections above should be inspected in the same methodology as previously described. This means a ground to top approach looking for issues with the structure, hardware, signage and aerial markings.

4. Structure Attachment Inspection Requirements

4.1. **Transmission Line Conductors**

4.1.1. A visual inspection of all phase conductors span back and span ahead should be completed at each structure examining the following components.

4.1.1.1. Damaged or Broken Strands – Note strands that are broken, burned, shot, or physically damaged. Record the location of the damage and number of strands broken.

4.1.1.2. Foreign Objects – Note any foreign objects on the conductors such as vegetation, balloon strings, plastic, shoes, etc.

4.1.1.3. Conductor Joints – Visually inspect full tension joints and loop joints for signs of heating, flashing, missing bolts, or mechanical damage. This include compression joints and bolted terminal connections.

4.1.1.4. Conductor Clamps – Visually inspect the conductor clamps on a structure for signs of heating, mechanical damage, and fatigue. Note hardware fatigue, cotter pins missing or backing out, burns, evidence of slipping in compression joints, and missing or loosened bolts.

4.1.1.5. Tie Wires – Visually inspect tie wires on post insulators for evidence of loosening or damage. Ensure the wire is properly seated in the post groove.

4.1.1.6. Conductor Dampening Hardware – Visually inspect dampers for signs of fatigue or mechanical damage. Report loose, disconnected, or missing dampers.

4.1.1.7. Conductor Spacers – Visually inspect conductor spacers for evidence of flashing, fatigue, and mechanical damage. If broken spacers are found, particularly on “hair-pin” type spacers, examine the conductor for evidence of cutting near the break point.

Priority 1 broken “Hair-pin” with >20% broken strands. Viewed from the ground.

4.1.1.8. Line Surge Arrestors – Visually inspect line surge arrestors for cracking, deterioration, or mechanical damage. Report blown isolators, disconnected conductor or ground leads, missing or worn attachment hardware.

4.2. Insulators and Hardware

4.2.1. All phase insulators and hardware shall be visually inspected during a structure inspection. Insulators fall into two main classes – Porcelain or Glass and Polymer

4.2.2. Hardware – Visually inspect all hardware connecting an insulator to a structure and insulator to conductor clamp for signs of mechanical damage or fatigue. Metal on metal connections between shackles, U-bolts, hooks, rings, and clevises should be examined with binoculars to look for signs of material loss, melting, cutting, missing bolts and/or pull through.

Priority 0 – Failed U-bolt detached on one end.

Priority 1 – Heavily rusted hardware suspected of wearing through pin.

4.2.3. Porcelain or Glass Insulators

4.2.3.1. Visually inspect insulator strings for broken bells. Report broken bells if the minimal threshold in a string is met: 44/69kV lines – 2 or more bells broken, 100/115kV lines -3- or more broken bells: 230/345/500kV – 4 or more broken bells. Note that chipped bells do not meet the definition of broken.

4.2.3.2. Visually inspect for evidence of pin rusting. Note significant corrosion, pin narrowing, or base swelling.

4.2.3.3. Visually inspect cotter pins for backing out or missing.

4.2.3.4. Report pin type insulators mounted above a crossarm with a broken top skirt or 2 or more broken skirts in any location.

4.2.3.5. Report pin type insulators mounted above a crossarm rolled greater than 30 degrees from vertical.

4.2.4. Polymer Insulators

4.2.4.1. Polymer insulators operating at 138kV or above should have corona rings attached at the energized end. Inspect for missing or improperly installed corona rings. Note, this does not apply to line post insulators.

4.2.4.2. Visually inspect for cut sheaths or openings in the polymer around the insulator rod.

4.2.4.3. Visually inspect the energized end of the insulator for significant alligatoring or cracking. This is often accompanied by a whitening of the insulator

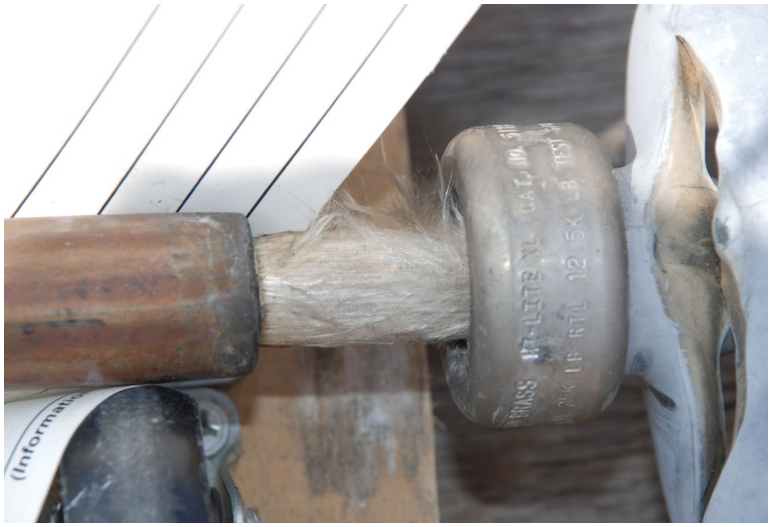
4.2.4.4. Visually inspect for any exposing of the fiberglass rod.

4.2.4.5. Visually inspect for mechanical or electrical damage resulting from tracking or flashing.

Priority 2 – Rolled pin insulator greater than 30 degrees

Priority 1 Porcelain Spark Erosion

Priority 1 “Ball and Socket” insulator pin erosion



Priority 1 Polymer with exposed fiberglass rod.

Priority 1 Polymer insulator with split housing.

4.3. **Structure Guying**

4.3.1. Note conditions of structure guys and its components.

4.3.2. Guy Wire -Visually inspect the guy wire for signs of corrosion, mechanical damage, or broken strands.

4.3.3. Guy Wire Preforms – Inspect the preform for signs of wear or mechanical damage.

4.3.4. Anchor – Inspect anchor groundline interface for signs of loosening or pulling out, corrosion, or mechanical damage to the anchor rod. Guy rod eye and preform must be above ground.

4.3.5. Guy Sticks – Visually inspect fiberglass insulating stick for signs of wear, cracking, backing out or missing cotter pins.

4.3.6. Guy Grounding – Visually inspect to ensure that guys all have a continuous path to ground. Structures utilizing guy sticks should have connections between guys below forming a path to structure, typically on the guy attached to the shield wire.

4.4. **Shield Wires – OHGW & OPGW**

4.4.1. A visual inspection of OHGW and OPGW span back and span ahead should be completed at each structure examining the following components.

4.4.1.1. Damaged or Broken Strands – Note strands that are broken, burned, shot, or physically damaged. Record the location of the damage and number of strands broken.

4.4.1.2. Foreign Objects – Note any foreign objects on the conductors such as vegetation, balloon strings, plastic, shoes, etc.

4.4.1.3. Joints – Visually inspect full tension joints and loop joints for signs of heating, flashing, missing bolts, or mechanical damage. This include compression joints and bolted terminal connections.

4.4.1.4. Shield Clamps – Visually inspect the shield clamps on a structure for signs of flashing, mechanical damage, and fatigue. Note hardware fatigue, cotter pins missing or backing out, burns, evidence of slipping in compression joints, and missing or loosened bolts.

4.4.1.5. Grounding – Ensure grounding connection is intact and not damaged, disconnected, or burned.

4.4.1.6. OPGW Splice Cans – Visually inspect fiber optic splice cans for mechanical damage. Report if the splice cannister is laying on the ground.

4.5. **Line Switching Points**

4.5.1. Note the condition of line switching points.

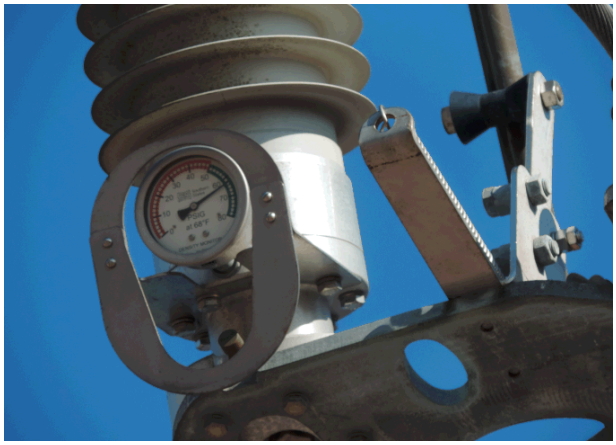
4.5.1.1. Switch Operators – Visually inspect switch operator (swing handle, crank handle, or motor operator) for signs of damage or vandalism, missing locks, or missing grounds.

4.5.1.2. Operating Pipe – Visually inspect operating pipe for signs of mechanical damage, cracking, or missing bolts.

4.5.1.3. Conductor Terminations – Visually inspect conductor terminations for signs of heating, flashing, missing bolts, or loose connections.

4.5.1.4. Line Switch Live Parts – Visually inspect switch live parts for signs of breakage, flashing, or loosening.

4.5.1.5. Line Switch Insulators – Visually inspect line switch insulators for signs of breaks or flashing.



SF6 Gas Level on Southern States must be in the Green Region

S&C Target is Normally White. Red Target Indicates Low Gas

5. Reject Criteria Priority Definitions

5.1. **Priority 0 – Emergency: All priority 0 issues shall be reported to Duke Energy immediately.**

5.1.1. Structure or equipment issues that have a significant and immediate impact on the health and safety of personnel, the environment, or the general public and require immediate attention.

5.1.2. These issues pose immediate risks to safety or system integrity.

5.1.3. Duke Energy field supervision shall be contacted, and the contractor will remain on site until Duke Energy personnel arrives and the area is secured.

5.2. **Priority 1 – Emergent:**

5.2.1. The structure or its components are deteriorated or damaged to the extent that it poses moderate probability of impacting system reliability but does not require immediate attention.

5.2.2. Structures or components require replacement in an expedited manner as defined by work management.

5.3. **Priority 2 – Routine:**

5.3.1. The structure or its components are deteriorated or damaged but pose a very low to no probability of an outage and pose no safety risks.

5.3.2. Asset needs repair or replacement and can be built into normal work schedules.

5.4. **Priority 9 – Monitoring:**

5.4.1. The structure or its components need repair or maintenance on non-critical components, however, there is no safety or reliability risk.

5.5. All work orders will be completed in accordance with the Transmission Work Management Corrective Work Process, document ADMP-ADM-TRM-00052.

5.6. Reference Appendix A in this document for table of Priority Codes.

6. Structure Tagging

6.1. All inspected poles shall be marked with an aluminum tag identifying the work performed, contractor name, and inspection date.

6.2. Inspection tags shall be placed five (5) feet above groundline on the side of the structure most easily seen from roads or nearby access locations.

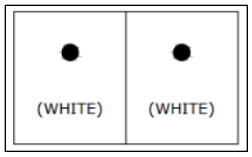
6.3. White tags will be used to identify only structures with damages compromising their structural integrity such as decay, deterioration, and critical damage. White tags shall not be placed on structures, for damages to insulators, hardware, conductor, or other non-structural issues.

6.4. Tags shall be attached to structure by use of waterproof adhesive or twist wire.

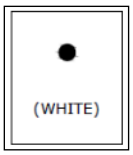
6.5. Priority 0 reject structures do not require tagging as Duke Energy's response will be immediate.

6.6. Priority 1 reject structures will be marked with **two** white 1-1/2" by 1-1/2" tags placed immediately below the inspection tag.

6.7. Priority 2 reject structures will be marked with **one** white 1-1/2" by 1-1/2" tag placed immediately below the inspection tag.



Priority 1 Reject Tag



Priority 2 Reject Tag

Inspection Tag

7. Quality Assurance and Quality Control

7.1. All work shall be entirely satisfactory to Duke Energy and shall be subject to inspection as required by Duke Energy.

7.2. The Contractor shall internally audit no less than 1% of all poles inspected by its inspectors. Poles are to be selected totally at random and be checked for accuracy and quality of work.

7.3. The quality control inspection shall be performed for each time period of not less than one (1) week's work but not to exceed two (2) weeks' previous work. The quality control inspection will be conducted with the Contractor's inspection supervisor and a Duke Energy representative when available.

7.4. The quality control inspection shall consist of the partial to complete re-inspection of those poles selected. The re-inspection shall include re-excavation and re-boring if those tasks were performed.

7.5. Serious errors found by Duke Energy will be brought to the attention of the Contractor. Corrective actions satisfactory to Duke Energy must be remedied before the next quality control check. The corrective action may include re-working all poles back to the previous quality control check point at no cost to Duke Energy.

7.6. Results of Contractor audits shall be communicated electronically to Duke and include the pole inspector names.

7.7. Duke Energy shall be issued a copy of the contractor quality control field report.

8. Photograph Requirements

8.1. A digital photograph is required to be taken of all defects that result in a Priority 1 or 2 rejected pole and attached to the structure's data sheet in Duke Energy's Collector application.

8.2. The photograph should be at least 1 megapixel in size resolution and be taken at a distance that clearly shows the defect but also includes as much as possible the pole and surroundings.

9. Data Collection

9.1. Data provided to the Contractor will be by electronic files in an Excel spreadsheet format.

9.2. Use of Duke Energy's Collector application will be required for inspections on the transmission system. The Collector application is a smart phone application which presents the user a map of the line they are inspecting and provides selectable forms to complete with each structure's inspection. Requirements for use of the Collector application are an iOS based smart phone with location services enabled. In addition, users of the application will need to be setup with Duke network identifications and complete required IT security forms.

9.3. Inspection contractors may also collect and provide Duke Energy with inspection data in their respective company's typical format. However, this data will not substitute as a replacement or be use in lieu of the Collector application.

9.4. Data deliverables and report requirements include but is not limited to the following;
- 9.4.1. Maintenance region
- 9.4.2. Line name, line code, and or line number
- 9.4.3. Structure number, including poles A, B, C, etc.
- 9.4.4. Structure GPS coordinates
- 9.4.5. Date pole inspected
- 9.4.6. Pole length and class
- 9.4.7. Pole manufacturer and birthmark date
- 9.4.8. Pole material type
- 9.4.9. Observed deficiencies and associated repair/replace priorities

9.5. Reporting Requirements
- 9.5.1. A summary of all poles inspected & work performed on an individual line or substation basis, including number of poles inspected, and failure rate.
- 9.5.2. Copies of all internal audit reports.
- 9.5.3. Reports are to be provided only after ALL work on a line is completed in its' entirety.
- 9.5.4. A weekly inspection progress schedule must be submitted to the Project Manager at the start of each week for the previous weeks work.
- 9.5.5. Duke Energy must be notified by email as line circuit inspections are completed to monitor timeline for end of circuit files and invoicing.
- 9.5.6. Invoicing and inspection reports are to be provided only after ALL work on a circuit is completed in its' entirety.
- 9.5.7. Invoices and end of circuit files must be sent to Duke Energy 30 days or less from time of notification of circuit inspection completion.
- 9.5.8. All invoicing for current year inspection program must be presented to Duke Energy for final payment no later than December 15th.

APPENDIX A

Component	Visual Inspect	Definitions of Reporting Issues Found	Priority Code	Repair/Replace Asset
Overall Site Condition	Data Collection	Record all requested attributes - Foundation Type, Structure Material, etc.		
Overall Site Condition	Erosion	Erosion issues that are worsening, affecting the access and stability of the line structures.	2	Repair
Overall Site Condition	Standing Water	The metallic portion of a tower or pole is permanently in standing water.	9	Repair
Concrete Foundations	Concrete to Structure Connection	Heavy rust and metallic cross-section loss >50%	1	Replace
Concrete Foundations	Concrete to Structure Connection	Heavy rust and metallic cross-section loss >25%	2	Replace
Concrete Foundations	Foundation Surface	Bowl formed around structure connection. Water cannot drain from top and is standing against metal.	9	Repair
Concrete Foundations	Cracking	Cracking greater than 1/4" with rusting present in the crack.	2	Replace
Concrete Foundations	Cracking	Significant cracking on an engineered foundation greater than 1/4" wide that has exposed the anchor rods connecting the structure.	1	Replace
Lattice tower	Bolts	Missing	2	Replace
Lattice tower	Bolts	Loose, damaged, severe rust corrosion	2	Replace
Lattice tower	Steel members	Damaged, Missing	1	Replace
Lattice tower	Steel members	Missing, loose, damaged, Severe rust corrosion	2	Replace
Lattice tower	Signage danger	Damaged, Missing	9	Repair
Lattice tower	Numbering	Damaged, Missing	9	Repair
Lattice tower	Climbing guards	Missing, broken, loose, damaged	2	Replace
Lattice tower	Grounding	Static connection to shield wire disconnected or tower ground wire cut/missing. *Note-ground wires only req. on towers with concrete foundations.	2	Replace
Engineered Poles	Base plate	Broken, cracked welds, weep holes clogged in pole	2	Replace
Steel Poles/Engineered Poles	Arm attachments	Broken, cracked welds, loose bolts, damaged hardware.	1	Replace
Steel Poles/Engineered Poles	Anchor Bolts	Loose nuts, rust deterioration	9	Repair
Steel Poles/Engineered Poles	Leaning	More than 10% of pole height	1	Replace
Steel Poles/Engineered Poles	Numbering	Missing	9	Repair

Component	Visual Inspect	Definitions of Reporting Issues Found	Priority Code	Repair/Replace Asset
Steel Poles/Engineered Poles	Grounding	Static Ground or Pole Ground is Disconnected	2	Repair
Aluminum Towers	Climbing Deterrent	Narrow based aluminum towers in city missing climbing deterrent	2	Replace
Concrete Poles	Cracks	Rust Migrating from cracks	9	Repair
Concrete Poles	Fractured	Pole concrete noticeable vertically or horizontally cracking	2	Replace
Concrete Poles	Leaning	More than 10% of pole height	1	Replace
Conductor	Wire Strands	Broken strands more than 20% repair	1	Repair
Conductor	Wire Strands	Broken strands less than 20% repair	2	Repair
Conductor	Steel core	Steel core strands damaged repair	1	Repair
Conductor	Splices	Discoloration signs of burning, heating	2	Repair
Conductor	Spacers	Broken, loose, corona cutting, missing	2	Repair
Conductor	Clamps	Missing nuts, bolts, cotter pins, casting issue	2	Repair
Conductor	Hardware	Deterioration of pins, shackles, hooks, work holes, bolts nuts missing or loose	2	Repair
Conductor	Tie Wire	Loose, broken, burned, untied	1	Repair
Conductor	Switch Termination	Discoloration signs of burning, heating, bolts loose at switch pad	2	Repair
Conductor	Arrester	Blown arrester, damaged, isolator, flashed	2	Repair
Conductor	Outriggers	Tension of conductor bending of outriggers	2	Repair
Insulator	Porcelain/glass	44kv/69kv 2 or more broken units, replace	2	Replace
Insulator	Porcelain/glass	100/115kv 3 or more broken units, replace	2	Replace
Insulator	Porcelain/glass	230/345/500KV 4 or more broken units, replace	2	Replace
Insulator	Porcelain/glass/Polymer	Ball and socket type, erosion of ball shank, socket locking pin out, cotter pin missing on dead-end.	2	Replace
Insulator	Polymer	Exposed fiberglass rod	1	Replace
Insulator	Polymer	Cut, torn, punctured sheath skirt	2	Replace
Insulator	Porcelain/glass/Polymer	Heavy contamination, example bird dropping	2	Replace
Insulator	Porcelain/glass/Polymer	Moderate contamination, example bird dropping	9	Repair
Insulator	Polymer	115kv and above no corona ring	9	Repair
Insulator	Post porcelain	Broken affecting the conductor groove and possibility of failure	1	Replace
Insulator	Post porcelain	Broken skirts, cracked, flashed with minor possibility of failing	2	Replace
Insulator	Post porcelain	Broken skirts, chipped, flashed with no possibility of failing	9	Repair
Hardware	Hooks/Rings/Clevises/ U-bolts	Severe rusting and evidence of fatigue cutting of hardware supporting insulator strings	1*	Replace
Guying	Guy anchor rod	Broken	0	Repair

Component	Visual Inspect	Definitions of Reporting Issues Found	Priority Code	Repair/Replace Asset
Guying	Guy Preform	Broken	0	Repair
Guying	Guy Wire	Broken	0	Repair
Guying	Guy Preform	Damaged, severe rust corrosion,	2	Repair
Guying	Guy Wire	Damaged, severe rust corrosion	2	Repair
Guying	Guy anchor rod	Buried below ground, Damaged, severe corrosion	2	Repair
Static/OPGW	Structure Ground Wire	Bonding point to structure is missing, loose, or damaged.	2	Repair
OPGW	Splice Can on Ground	Splice cannister laying on ground and not in enclosure on mounted on the structure.	2	Repair
Static/OPGW	Broken Strands	Broken strands more than 20% repair	1	Repair
Static/OPGW	Broken Strands	Broken strands less than 20% repair	2	Repair
Switch Terminations	Switch Live Parts	Damaged, broken parts, loose bolts, Discoloration signs of burning, heating	2	Repair
Switch Terminations	Switch Blade Position	If not in fully Closed position or Open position,	1	Repair
Switch Terminations	Interrupter bottles	Flashed, broken, burned, loose, missing parts	2	Replace
Switch Terminations	Ganged Switch Operating Pipe	Broken, loose, bend, slippage, cracked, severe rust corrosion	2	Repair
Switch Structures	Gas Indicator	Gas Indicator is red indicating low gas	2	Repair
Right of way	Encroachment	Construction, grading, building, etc.	1	Repair
Right of way	Erosion	Erosion issues that are worsening, affecting the access and stability of the line structures.	2	Repair
Right of way	Line crossing	New line constructed crossing under or in right of way	2	Repair
Right of way	Deer stand	Attached to structure	1	Repair
Right of way	Deer stand	Located in right of way	9	Repair
Aerial Markers	Marker Balls	Aerial Marker ball is damaged, broken, or disconnected	2	Repair

* - Insulator hardware replacements should include the entire insulator string.

Document Approval Form

issued 6/24/21

Section A: Document identification and type of action (Instructions for completing form on page 2)

Document no.: TECP-MIM-TRM-00121 | Revision no.: 002

Document title: ~~Transmission Wood Structure Inspection Guidelines~~ Transmission Non-Wood Structure Visual Inspection Guidelines

Applies to: (Select all that apply)

- ☒ Duke Energy
- ☐ Duke Energy Carolinas, LLC
- ☐ Duke Energy Progress, LLC
- ☐ Duke Energy Florida, LLC
- ☐ Duke Energy Indiana, LLC
- ☐ Duke Energy Kentucky, Inc.
- ☐ Duke Energy Ohio, Inc.
- ☐ Group _____
- ☒ Department Transmission- ALL
- ☐ Other _____

Type of action:

- ☐ New
- ☒ Revision
- ☐ Periodic review completed
- ☐ Ownership Change
- ☐ Cancellation
- ☐ Suspension
- ☐ Renumber

Periodic Review cycle: (Default is 2-year)

- ☐ 1-Year
- ☐ 2-Year
- ☒ 3-Year
- ☐ 4-Year
- ☐ 5-Year

Compliance Applicability: (required field)

- ☒ None
- ☐ NERC
- ☐ State Codes/Standards
- ☐ FERC Standards of Conduct
- ☐ Patriot Act
- ☐ Sarbanes-Oxley
- ☐ HIPAA
- ☐ OSHA _____
- ☐ Other _____

- ☐ Communication plan established
- ☐ Impact Reviews completed

For Doc. Mgmt staff use only:

- ☐ Editorial Change
- ☐ Control element revision

(does not require approval signature)

Security Restrictions Required: ☐ Yes ☒ No If yes, explain _____

Document Collection name(s): (Not Required - A unique grouping of like documents.)

Complete if submitting a form:

Does the form have a parent, governing or instructional procedure? ☐ No ☐ Yes (Procedure No: _____)

How is the form to be completed or used? ☐ Hard Copy (completed by hand) ☐ Online Data Entry (fillable PDF)

Description of document action or summary of changes:
revison: 2 added clarification of white tags use

Section B: Approval **Who should sign?** see instructions on page 2

Author(s)/Writer(s)/Preparer(s) (*signature not required*):
Tim Mosteller

Approval recommended (*print name*): Tyler Johnson	(*signature*)	Date:
Approval recommended (*print name*):	(*signature*)	Date:
Approval recommended (*print name*):	(*signature*)	Date:
Final Approval (*print name*): Andrew Adldoost	(*signature*) Digitally signed by Andrew Adldoost Date: 2021.06.22 15:08:34 -04'00'	Date:

Return signed form as a PDF to TransDocumentMgmt@duke-energy.com.

Keywords: procedures and forms; procedures program; DAF; ADMP-PRO-ADS-00002; document management program
Applies to: Duke Energy - Transmission; Enterprise Operational Excellence

ATTACHMENT K

Purpose and Intent of the Plan:

To implement and update a wood pole inspection program that complies with FPSC Order No. PSC-06-0144-PAA-EI issued February 27, 2006 (the "Plan"). The Plan concerns inspection of wooden transmission and distribution poles, as well as pole inspections for strength requirements related to pole attachments. The Plan is based on the requirements of the National Electric Safety Code ("NESC") and an average eight-year inspection cycle. The Plan provides a detailed program for gathering pole-specific data, pole inspection enforcement, co-located pole inspection, and estimated program funding. This Plan also sets forth pole inspection standards utilized by Duke Energy Florida ("DEF") that meet or exceed the requirements of the NESC.

The Plan includes the following specific sub-plans:

- Transmission Wood Pole Inspection Plan ("Transmission Plan").
- Distribution Wood Pole Inspection Plan ("Distribution Plan").
- Joint Use Wood Pole Inspection Plan ("Joint Use Plan").

These three inspection sub-plans are outlined and described below. All of these sub-plans will be evaluated on an ongoing basis to address trends, external factors beyond the Company's control (such as storms and other weather events), and cost effectiveness.

1) Transmission Wood Pole Inspection Plan

A. Introduction

Ground-line inspection and treatment programs detect and treat decay and mechanical damage of in-service wood poles. DEF's Transmission Department accomplishes this by identifying poles that are 8 years of age or older and treating these poles as necessary in order to extend their useful life. As required, DEF also assesses poles and structures for incremental attachments that may create additional loads. Poles that can no longer maintain the safety margins required by the NESC (ANSI C2-2002) will be remediated. These inspections result in one of four or a combination of the following actions: (1) No action required; (2) Application of treatment; (3) Repaired; (4) Replaced. (DEF's Transmission Department follows TECP-MIM-TRM-00118, Transmission Wood Pole Inspection, Boring, Excavation, and Treatment Guideline along with TECP-MIM-TRM-00026 (NOTE 1), Transmission Line Material Condition Assessment Procedure as assurance of the implementation of the plan.

NOTE 1: TECP-MIM-TRM-0026-Rev.003 was rescinded and replaced by TECP-MIM-TRM-0121-Rev.002 Transmission Non-Wood Structure Visual Inspection Guidelines on 06/24/2021.

B. General Plan Provisions

(i). Pole Inspection Selection Criteria

Transmission performs ground patrols to inspect transmission system line assets to allow for the planning, scheduling, and prioritization of corrective and preventative maintenance work. These patrols assess the overall condition of the assets including insulators, connections, grounding, and signs, as well as an assessment of pole integrity. These patrols are done on a four-year cycle. The ground patrol inspections categorize wood poles into four conditions, Priority 0, 1, 2, or 9.

In performing inspection and patrols, the following Transmission Line Wood Poles Inspection State Categories shall apply:

Priority 9 is described as meeting ANY of the conditions listed below and should have a repair work order written:

- Woodpecker holes not meeting the criteria for pole replacements; for example:
  - Woodpecker holes are present but can be patched and repaired
  - Woodpecker holes are not located in critical pole locations
  - Woodpecker holes are limited to "baseball" size in diameter, they do not extend into the pole more than 4 inches, and will not hold water
- Other minor deficiencies as described in document TECP-MIM-TRM-00026 or TECP-MIM-TRM-00118

Priority 2 is described as meeting ANY of the conditions listed below and should have a replacement work order written. These poles have a low probability of causing an outage and will be replaced during normal work schedules.

- Hammer test or probing at ground-line reveals internal rot, decay, or hollowness with a shell thickness of 2 - 4 inches is found at any location.
- Hammer test or probing at ground-line reveals rot or decay extends 3 or more inches into the pole along more than one-quarter of the pole circumference.
- Contractor "effective diameter" calculations determine the pole has lost more than 33 percent of the original pole strength.
- Hammer test reveals significant shell cracking or soft wood, indicated by sound or caving of the wood.
- Woodpecker holes contain extensive nesting cavities in critical locations, including vicinity of cross-arm, plank-arm, cross-brace, guy, or insulator connections
- Woodpecker holes are extensive and generally at least "softball" sized.
- Pole checks up the pole reveal significant evidence of decay, insect damage, or shell separation, as indicated by caving the pole, sawdust, or sound.
- Longitudinal pole deflection is between 3 – 5 feet.
- Transverse pole deflection is more than 20 degrees.
- Earth washout at the pole base is so substantial that it requires replacement.
- Pole must meet NESC "at replacement" strength requirements, which occurs when at least two-thirds of the original required pole strength remains. This is specified in the NESC Code, Table 26101A, Footnote 2.

Priority 1 is described as meeting ANY of the conditions listed below. This pole should have a replacement work order written and will be replaced within 12 weeks of identification.

- Hammer test or probing at ground-line reveals internal rot, decay, or hollowness with a shell thickness of 2 inches or less is found in any location.
- Hammer test or probing at ground-line reveals rot or decay that extends more than 2 inches into the pole along more than one-quarter of the pole circumference.
- Contractor "effective diameter" calculations determine the pole has lost more than 50 percent of the original pole strength.
- Woodpecker holes extend through the pole and daylight is visible.
- Longitudinal pole deflection exceeds 5 feet.
- Extensive longitudinal cracking exists through critical attachments of the pole
- Earth washout at the pole base compromises the pole integrity.

Priority 0 are immediate Pole Replacements; these poles shall be reported, and replacement efforts will begin immediately if the Pole is broken or Pole is in imminent danger of failing or has initial signs of failing.

(ii). Ground-Line Inspections

Ground-line inspections of wood transmission poles are conducted on an average 8-year cycle. This results in, on average, approximately 12.5% of the remaining population of wood poles receiving this type of inspection on an annual basis. (Reference: TECP-MIM-TRM-00118 for inspection requirements.)

Soil excavation requirements

Excavation should only be initiated after it is determined that the sounding test or visual inspection up the pole does not already deem that the pole needs to be replaced. Soil is to be removed around the entire pole to a depth of 12 inches. The hole shall extend at least 4 inches from the pole at the 12-inch depth and 10 inches from the pole at ground-line.

If any sign of decay, soft wood, hollowness, or abnormal coloration is found, the pole is also to be probed or drilled with a suitable tool to ascertain the extend of the deterioration. CCA poles 15 years old or less are not to be excavated unless decay is found during sounding and probing.

Boring requirements

When borings are required a 3/8" diameter boring shall be drilled adjacent to where the most suspected decay is found during the sounding test. If no decay is suspected, the boring shall be taken near the deepest check. If there are no checks the boring shall be taken on either side of the pole in the same direction as the line is facing. The boring shall begin pole entry at ground-line, be taken at a 45-degree angle, and proceed past the center of the pole. If decay pockets are detected, a minimum of two additional borings shall be taken to determine the extent of decay. Any pole with a hollow center shall have the thickness determined

with a shell depth indicator. All inspection holes shall be plugged with tightly fitting CCA-treated wood dowels.

Pole Treatment requirements

When poles are found to have decay or to be hollow, treatment shall be applied only from below grade to 18-inches above ground-line. Treatment is not to be applied above 18 inches. Treatment shall utilize a ½" hole is drilled to ensure the applied product is as close to the decayed pole regions as possible. The treatment hole shall be drilled at a 30-degree downward angle to a maximum depth of 12 inches, or to the center of the pole. If preservative rods are used, two shall be applied to each drilled hole. All preservative holes shall be sealed with a removable threaded plastic plug.

If previously treated poles meet the strength requirements to remain in service and it is determined additional preservative is required, before drilling any new holes the following is to be performed;

- Existing holes in the vicinity of the new needed treatment are to be opened and the existing rods evaluated for decay.
- If the rods are decayed two new ones are to be inserted.
- If the existing rods are not decayed adding new ones will not be effective. When this is observed, NO new rods are to be added.
- If the existing treatment plug is wood, it is to be replaced with a removal plastic plug. If necessary, use a larger size as removal of the wood plug may have damaged the hole.

Poles with no indication of decay are not to be treated. Poles meeting the criteria to be replaced due to the sounding test, drilling, or visual inspection up the pole are not to be treated.

(iii) Structural Integrity Evaluation

- See 3) Joint Use Pole Inspection Plan, section B, paragraph (ii).

(iv). Records and Reporting

A pole inspection report will be filed with the Florida Public Service Commission by March 1st of each year. The report shall contain the following information:

1) A description of the methods used for structural analysis and pole inspection.

2) A description of the selection criteria that was used to determine which poles would be inspected.

3) A summary report of the inspection data including the following:

   a. Total number of wood poles in Company inventory. *
   b. Number of pole inspections planned.

c. Number of poles inspected.
d. Number of poles failing inspection.
e. Pole failure rate (%) of poles inspected.
f. Number of poles designated for replacement.
g. Total number of poles replaced.
h. Number of poles requiring minor follow-up. *
i. Number of poles overloaded. *
j. Methods of inspection used.
k. Number of pole inspections planned for next annual inspection cycle.
l. Total number of poles inspected (cumulative) in the 8-year cycle to date.
m. Percentage of poles inspected (cumulative) in the 8-year cycle to date.

4) A pole inspection report that contains the following detailed information:

a. Transmission circuit name.
b. Pole identification number.
c. Inspection results.
d. Remediation recommendation.
e. Status of remediation.

*Estimates based on averages and previous years completions.

C. Program Cost and Funding

- DEF continues to meet the obligations set forth in Order No. PCS-06-0144-PAA-EI. The number of poles inspected per year will start at approximately 3,000 poles but may vary from year to year depending on previous years' accomplishments.

DEF is currently on track to meet the 8-year cycle requirements. The number of poles inspected may vary year to year depending on the previous year's accomplishments with the intent to complete inspections in the required timeframe. The estimated figures in the chart below are "best estimates," given information and facts known at this time and are subject to change or modification.

Wood Pole Program Cost Estimates

Annual Unit & Cost Estimate		
Cycle		
Years per cycle	8	
Poles inspected per year	3,000	On average; may vary year to year
Assumed poles replaced (1)	5%	Current future projections
O&M Cost		

GL Inspection & Treatment	$100,000	On average; may vary year to year
Capital Cost (2)		
Hurricane Hardening	$20,000,000	On average; may vary year to year

Note 1: Assumption is made that approximately 5% of the poles inspected will be identified for replacement.
Note 2: Capital Improvements can include various replacements beyond wood pole replacements, such as insulator, conductor and /or static replacements.

2) Distribution Wood Pole Inspection Plan

A. Introduction

In accordance with FPSC Order No. PSC-06-0144-PAA-EI, DEF's Distribution Department inspects Company-owned wood poles on an average 8-year cycle. These inspections determine the extent of pole decay and any associated loss of strength. The information gathered from these inspections is used to determine pole replacements and to effectuate the extension of pole life through treatment and reinforcement. Additionally, information collected from the wood pole inspections is used to populate regulatory reporting requirements, provide data for loading analyses, identify other equipment maintenance issues, and used to track the results of the inspection program over time.

B. General Plan Provisions

(i). Ground-line Inspection Purpose

- The ground-line inspection process is the industry standard for determining the existing condition of wood pole assets. This inspection helps to determine extent of decay and the remaining strength of a pole. Ground-line inspections also provide insight into the remaining life of a wood pole.

- The ground-line inspection is performed at the base of the pole because the base is the location of the largest "bending moment," as well as the area subject to the most fungal decay and insect attack. Assessing the condition of the pole at the base is the most efficient way to effectively treat and restore a wood pole.

(ii). Pole Inspection Process

When a wood distribution pole, other than a CCA pole, is inspected, the tasks listed below will be performed. For a CCA type wood distribution pole less than 16 years of age, the inspection will consist of

a visual above ground inspection and sounding with hammer, both procedures are described below. For CCA poles 16 years of age and greater, all inspection methods described below are used. Boring at Ground Line is also performed on type CCA poles when decay is present.

- Above Ground Observations - Visual inspection of the exterior condition of the pole and visual inspection of components hanging from the pole.
- Partial Excavation – The soil is removed around the base of the pole and the pole is inspected for signs of decay.
- Sound with Hammer – The exterior of the pole is tested with a hammer and the inspector listens for "hollowness" of the pole.
- Bore at Ground Line – The pole is bored at a 45-degree angle below the ground line. This inspection method helps to determine internal decay at the base as well as measure the amount of "good wood" left on the interior of the pole.
- Excavate to 18 Inches (Full Ground Line Inspection) – If significant decay is found during the full excavation, the soil is removed 18 inches below ground line. Decay pockets are identified and bored to determine the extent of decay.
- Removal of Surface Decay – Identified areas of decay are removed down to "good wood" using a sharp pick.
- Prioritization of rejected poles – rejected poles shall be assessed on their overall condition and then prioritized accordingly. Generally, these poles will then be replaced in order of priority, from highest to lowest.
- For poles where obstructions, such as concrete encasement, make full excavation impractical DEF will utilize the best economical inspection process in accordance with Order No. PSC-08-0644-PAA-EI issued October 6, 2008.

(iii) Data Collection

All data collected through the inspection process will be submitted to DEF's Distribution Department in electronic format by inspection personnel. This data will be used to determine effective circumference and remaining strength of the pole. In evaluating pole conditions, deductions shall be made from the original ground line circumference of a pole to account for hollow heart, internal decay pockets, and removal of external decay. The measured effective critical circumference shall be at the point of greatest decay removal in the vicinity of the ground line taking into account the above applicable deductions. A pole circumference calculator shall be used to determine the measured effective critical circumference. To remain in service "as-is," the pole shall meet minimum NESC strength requirements. The measured effective critical circumference will be compared to the applicable minimum acceptable circumference listed in the most current versions of ANSI 05.1-1992, American National Standard for Wood Poles, and NESC-C2-1990(1). Poles below the minimum acceptable circumference shall be rejected and will be marked in the field for replacement.

(iv). Structural Integrity Evaluation

- See Joint Use Pole Inspection Plan, section B, paragraph (i).

(v). Records and Reporting

A pole inspection report will be filed with the Florida Public Service Commission by March 1st of each year. The report shall contain the following information:

1) A description of the methods used for structural analysis and pole inspection.

2) A description of the selection criteria that was used to determine which poles would be inspected.

3) A summary report of the inspection data including the following:

a. Total number of wood poles in Company inventory.
b. Number of pole inspections planned.
c. Number of poles inspected.
d. Number of poles failing inspection.
e. Pole failure rate (%) of poles inspected.
f. Number of poles designated for replacement.
g. Total number of poles replaced.
h. Number of poles requiring minor follow-up.
i. Number of poles overloaded.
j. Methods of inspection used.
k. Number of pole inspections planned for next annual inspection cycle.
l. Total number of poles inspected (cumulative) in the 8-year cycle to date.
m. Percentage of poles inspected (cumulative) in the 8-year cycle to date.

4) A pole inspection report that contains the following detailed information:

a. Distribution circuit name.
b. Pole identification number.
c. Inspection results.
d. Remediation recommendation.
e. Status of remediation.

C. Program Cost and Funding

(i). Poles Program Cost Estimates

DEF continues to successfully meet the obligations set forth in Order No. PSC-06-0144-PAA-EI and continues to inspect poles based on the 8-year cycle as mandated by the FPSC. The number of poles inspected per year is expected to be approximately 100,000 poles but may vary from year to year depending on previous years' accomplishments with the intent to complete inspections in the required timeframe. Funding requirements to meet all aspects of this program will be adjusted from year to year, as well. DEF is currently on track to meet the 8-year cycle requirements.

The estimated figures in the charts below are "best estimates," given information and facts known at this time and are subject to change or modification.

Annual Unit Estimate

Years per Cycle	# of Wood Poles to be inspected per year	Replacements	Bracing	Treatments
8	100,000	5,984	700	70,000

Annual Cost Estimate

Yrs per Cycle	O&M Costs		Capital		O&M Total	Capital Total	Program Total Cost
	Inspections (S&B + Excavation)	Treatments (add'l to inspection)	Replacements	Braces			
8	$ 1,400,000	$ 2,600,000	$ 36,317,000	$ 600,000	$ 4,021,000	$ 36,917,000	$ 40,938,000

* Inspection and Treatment costs are not currently split in financials. Best estimates were given knowing cost and estimated numbers for treatments.

3) Joint Use Pole Inspection Plan

A. Introduction

DEF currently has approximately 774,000 joint use attachments on distribution poles and approximately 7,400 joint use attachments on transmission poles. On average, DEF receives approximately 3,000 new attachment requests per year. All new attachment requests are reviewed in the field to assure the new attachments meet NESC and company clearance and structural guidelines. The information provided below outlines DEF's attachment permitting process and how DEF intends to gather structural information on certain existing joint use poles over an average 8-year inspection cycle to meet the obligations set forth in Order No. PCS-06-0144-PAA-EI.

B. General Plan Provisions

(i). Structural Analysis for a Distribution Pole New Joint Use Attachment

When the Joint Use Department receives a request to attach a new communication line to a distribution pole, the following is done to ensure that NESC clearance and loading requirements are met before permitting the new attachment:

- Each pole is field inspected, and the attachment heights of all electric and communication cables and equipment are collected. The pole number, pole size and class (type) are noted as well as span lengths of cables and wires on all sides of the pole.
- For each group of poles in a tangent line, the pole that has the most visible loading, line angle and longest or uneven span length is selected to be modeled for wind loading analysis.
- The selected pole's information is loaded into a software program called "SPIDA CALC" from IJUS. The pole information is analyzed and modeled under the NESC Light District settings of 9psf, no ice, 30° F, at 60 MPH winds to determine current loading percentages.
- If that one pole fails, the next worst-case pole in that group of tangent poles is analyzed as well.
- Each pole is analyzed to determine existing pole loading and the proposed loading with the new attachment.
- If the existing analysis determines the pole is overloaded, a work order is issued to correct the overload. The remedy may include replacing the pole with a larger class pole. If the pole fails only when the new attachment is considered, a work order estimate is made and presented to the communication company wishing to attach.

(ii). Structural Analysis for a Transmission Pole New Joint Use Attachment

When the Joint Use Department receives a request to attach a new communication line to a transmission structure with distribution underbuilt, the following will be done to ensure that NESC clearance and loading requirements are met before permitting the new attachment:

- The attachment heights of all electric and communication cables and equipment are collected. The pole number, pole size and class (type) are noted as well as span lengths of cables and wires on all sides of the pole.
- All structure information is modeled by transmission line engineering in PLS-CADD software for structural analysis.
- Line Engineering uses a most conservative approach by grouping the structures per request by "worst-case." The structure rating, material type, line angle, and span lengths are used to determine the most conservative approach.
- The selected structure information is loaded into the PLS-CADD software. NESC criteria is used and determined based on the pole location, rating of the line, and year of installation.
- Each structure is analyzed using a pass/fail approach with the existing pole loading and the proposed loading with the new attachment. If a structure fails in a specific grouping, the attachment request is denied for those grouped structures. If the most conservative structure passes, the next "worst-case" structure is then analyzed per grouping.

- If the existing analysis determines the structure is overloaded, this information is shared with maintenance and the wood pole replacement team to determine if the structure may need to be replaced or is in a replacement plan.
- If the structure is replaced, the GIS database is updated and an engineering change request (ECR) is created to reflect the date the new structure was installed.

(iii). Analysis of Existing Joint Use Attachments on Distribution Poles

There are approximately 774,000 joint use attachments on approximately 450,000 distribution poles in the DEF system. All distribution poles with joint use attachments will be inspected on an average 8-year audit cycle to determine existing structural analysis for wind loading. These audits will start at the sub-station where the feeder originates. For each group of poles in a tangent line, the pole that has the most visible loading, line angle, and longest or uneven span length will be selected to be modeled for wind loading analysis. Each pole modeled will be field inspected. The attachment heights of all electric and communication cables and equipment will be collected. The pole age, pole type, pole number, pole size / class, span lengths of cables and wires, and the size of all cables and wires on all sides of the pole will be collected.

The selected pole's information will then be loaded into a software program called "SPIDA CALC" from IJUS. The pole information will be analyzed and modeled under the NESC Light District settings of 9psf, no ice, 30° F, at 60 MPH winds to determine current loading percentages. If that one pole fails, the next worst-case pole in that group of tangent poles will be analyzed as well. Each pole analyzed will determine the existing pole loading of all electric and communication attachments on that pole. If the existing analysis determines the pole is overloaded, a work order will be issued to correct the overload. The remedy may include replacing the pole with a larger class pole. Should the original pole analyzed meet the NESC loading requirements, all similar poles in that tangent line of poles will be noted as structurally sound and entered into the database as "PASSED" structural analysis. Poles rated at 100% or lower will be designated as "PASSED." Poles that are analyzed and determined to be more than 100% loaded will be designated as "FAILED," and corrected. If the pole is changed out, the GIS database will be updated to reflect the date the new pole was installed.

(iv). Analysis of Existing Joint Use Attachments on Transmission Poles

The following analysis will be completed to ensure that NESC clearance and loading requirements are met in the event existing attachments are found that were not included in the Section B. (ii) Structural Analysis for New Joint Use Attachments:

- The attachment heights of all electric and communication cables and equipment are collected. The pole number, pole size and class (type) are noted as well as span lengths of cables and wires on all sides of the pole.

- All structure information is modeled by transmission line engineering in PLS-CADD software for structural analysis.
- Line Engineering uses a most conservative approach by grouping the structures of a given circuit by "worst-case." The structure rating, material type, line angle, and span lengths are used to determine the most conservative approach.
- The selected structure information is loaded into the PLS-CADD software. NESC criteria is used and determined based on the pole location, rating of the line, and year of installation.
- Each structure is analyzed using a pass/fail approach with the existing pole loading. If a structure fails in a specific grouping, the wood pole replacement team and maintenance group are notified to determine if the structure may need to be replaced or is in the replacement plan. If the most conservative structure passes, the next "worst-case" structure is then analyzed per grouping.
- If the structure is replaced, the GIS database is updated and an engineering change request (ECR) is created to reflect the date the new structure was installed.

(v). Records and Reporting

A pole inspection report will be filed with the Florida Public Service Commission by March 1st of each year. The report shall contain the following information:

1) A description of the methods used for structural analysis and pole inspection.

2) A description of the selection criteria that was used to determine which poles would be inspected.

3) A summary report of the inspection data including the following:

a. Number of poles inspected.
b. Number of poles not requiring remediation.
c. Number of poles requiring remedial action.
d. Number of poles requiring minor follow up.
e. Number of poles requiring a change in inspection cycle.
f. Number of poles that were overloaded.
g. Number of inspections planned.

C. Program Cost and Funding

(i). Pole Analysis Funding

As stated above, there are currently approximately 774,000 joint use attachments on approximately 450,000 distribution poles and approximately 7,400 joint use attachments on transmission poles. DEF will analyze the "worst case" poles in a tangent line of similar poles as deemed appropriate during field inspections.

In order to meet the obligations, set forth in Order No. PCS-06-0144-PAA-EI, DEF requires incremental funding annually to successfully gather data and enter it into the required reporting format. See calculation that follows. The estimated figures in these charts are "best estimates," given information and facts known at this time and are subject to change or modification.

Annual Unit & Cost Estimate

Distribution poles with joint use	Annual inspected (8-yr cycle)	10% of Distribution poles analyzed	1% of Distribution poles replaced	Transmission poles with joint use	Annual inspected (8-yr cycle)	30% of Transmission poles analyzed	10% of Transmission poles replaced	Total cost to analyze poles (O&M)	Total cost to replace poles (capital)
450,000	56,000	5,600	56	5900	738	221	22	$551,950	$585,000

Document title:	Document number:
Transmission Line Material Condition Assessment Procedure; Ground Patrols	TECP-MIM-TRM-00026
	Revision No.: 003
Keywords: TEEM-EE; transmission, line patrols, inspections	Applies to: Transmission – All Regions

1.0 Introduction

1.1 The material condition of the transmission line structures must be periodically inspected to ensure the assets are in optimum condition. The primary goal of the line assessment is to inspect transmission line structures and components to document material deficiencies so corrective repair/replacement work orders are written.

1.2 All structures on a line are to be inspected during a ground patrol, regardless of the pole material, inspections should extend from substation to substation, and are to include structures on any connected taps. It is the expectation of Duke Energy that all structures will be physical reached for inspections. Poles or tower bases that cannot be accessed during an inspection will be reported back to the program manager.

1.2.1 All wood poles inspected by the Duke Energy contractors shall utilize inspection techniques as detailed on other procedures included in the bid documentation including sound & bore, excavation, and treatment requirements.

1.2.2 All non-wood structures inspected by Duke Energy contractors shall be subject to an enhanced visual inspection with high focus on the presence of ground contact where not direct embedded, limited access due to water or heavy vegetation, and the presence of excessive rust. Each of these criteria and how they should be prioritized for follow up are described in Section 3.8, except for limited access, which should be reported back to the program manager as described in Section 1.2

1.2.3 The definitions contained herein are not only to be utilized by contractors but are also a useful guide for Duke Energy line technicians, field supervision, and other field personnel.

1.2.4 In some Duke Energy jurisdictions regulatory requirements are more stringent than what is contained in this document; when that is the case the regulatory criteria shall be followed.

1.2.5 Inspection of ALL transmission structure components on a line, including poles, insulators, crossarms, guying, bonding, conductors, statics, and grounding systems is expected. Any attached distribution underbuild is also to be inspected for signs of obvious defects.

1.2.6 The intent of this guidance procedure is to capture component deficiencies in a consistent manner across the entire Duke Energy System. Deficient material replacements are identified as either a Priority 0, 1, & 2, and repairs as a Priority 9. These conditions are used to create corrective work orders using Duke Energy software.

2.0 Component Assessment Definitions

2.1 **PRIORITY 0** is a condition that poses an immediate threat to either safety or system integrity. When this condition is encountered, a phone call to field supervision shall be immediately made and the contractor must stay on site until Duke Energy personnel arrives and the area is secured. (Note; examples of this condition are NOT shown in the next section).

2.2 **PRIORITY 1** components are deteriorated and require attention but does not pose an immediate threat to safety or the system. Depending on specific regional instructions, a phone call may be required to the field supervision when this condition is found (expectations vary between regions). A Priority 1 corrective work order will be written when this condition is reported, and replacement/repairs completed within 12 weeks.

2.3 **PRIORITY 2** components are deteriorated and in need of replacement. A Priority 2 corrective work order will be written when this condition is reported.

2.4 **PRIORITY 9** has some maintenance issues requiring repair, consisting of non-critical work, but the component is in otherwise good condition.

3.0 Structure Components & Priority Codes

3.1 Transmission Wood Poles

3.1.1 **Priority 9** is described as meeting ANY of the conditions listed below and should have a repair work order written:

- Woodpecker holes are present but can be patched and repaired
- Woodpecker holes are not located in critical pole locations
- Woodpecker holes are limited to “baseball” size in diameter, they do not extend into the pole more than 4 inches, and will not hold water
- Earth washout at pole base requires mitigation

Priority 9 Woodpecker Holes
(Not in critical locations)

Priority 9 Woodpecker Hole
(Does not hold water & can be repaired)

3.1.2 **Priority 2** is described as meeting ANY of the conditions listed below and should have a replacement work order written:

- Hammer reveals significant groundline decay pockets that are greater than 6 inches wide and 3 inches deep extending over more than one-quarter of the pole circumference
- Pole is hollow with less than 4 inches of shell thickness extending over more than one-quarter of the pole circumference
- Hammer reveals significant shell cracking or soft wood, indicated by sound or caving of the wood
- Woodpecker holes are extensive and generally at least “softball” sized or greater and extend to the pole center, severely affecting the pole integrity
- Woodpecker holes contain extensive nesting cavities in critical locations. including vicinity of crossarm, plankarm, crossbrace, guy, or insulator connections
- Woodpecker holes contain nesting cavities, or can be seen to hold water
- Pole checks reveal significant evidence of decay, insect damage, or shell separation, as indicated by caving the pole, sawdust, or sound
- Longitudinal pole top deflection is between 3 to 5 feet
- Transverse pole deflection of more than 20 degrees
- Earth washout at pole base is so substantial it requires replacement
- Pole top decay shall be identified as a pole replacement **ONLY** if the hardware supporting the static has moved or has been jeopardized, the pole top has a significant split, or woodpecker holes are evaluated to be extensive. ***Duke Energy employees are responsible for accessing pole top decay during routine aerial inspections.***

Priority 2 Split Pole Top & Vertical Woodpecker Holes

Priority 2 Woodpecker Holes
(located in critical spots)

Priority 2 Woodpecker Holes
(Quantity and orientation indicates significant pole decay)

3.1.3 **Priority 1** is described as meeting ANY of the conditions listed below. This pole should have a replacement work order written:

- Hammer and probing reveals decay extending towards the pole center
- Pole is hollow with less than 2 inches of shell thickness extending over more than one-quarter of the pole circumference
- Woodpecker holes extend through the pole and daylight is visible.
- Longitudinal pole deflection exceeds 5 feet
- Extensive longitudinal cracking exists through critical attachments of the pole
- Earth washout at pole base possibly compromises the structure integrity

Priority 1 Internal Decay
(Shell thickness less than 1 inch)

Priority 1 Internal Decay
(Deep decay pocket)

Green Growth
(May be an indicator of substantial pole decay)

Priority 1 Woodpecker holes
with a large internal cavity

Priority 1 Groundline Pole Decay

3.2 Transmission Line Crossarms, Plankarms, Crossbraces, & Kneebraces

3.2.1 **Priority 9** is described as meeting one or more of the conditions listed below. Repairs work orders will be written.

- Hardware is missing or is visually seen to be loose

3.2.2 **Priority 2** is described as meeting ANY of the conditions listed below and should be scheduled to be replaced:

- Member has wide (> 1 inch) cracks that can hold water
- When hammer tested member can be caved
- Separation exists between laminate sections of crossbraces
- Woodpecker holes are present
- Crossarm out of plumb or rolled by more than 45 degrees
- Crossarm supporting brace is broken

Priority 2 Rolled Pin Type Insulator Mounted above Wood Arm

3.2.3 **Priority 1** is described as meeting ANY of the conditions listed below and should be scheduled to be replaced:

- Member is either split or broken

3.3 Transmission Line Porcelain Insulators

3.3.1 **Priority 9** is described as meeting the condition listed below. A repair work order will be written.

- Insulator units with significant bird contamination

3.3.2 **Priority 2** is described as meeting one or more of the conditions listed below and should be replaced:

- Suspension type insulators have pin rust with some loss of material and/or swelling of the pin base
- Suspension type insulators with two or more significantly broken insulators in a string at 44 kV, three or more at 69/115 kV, and four or more at 230/345/500 kV. NOTE: Chipped Insulators do not meet the definition of broken.
- Insulators with significant signs of flashing or burn. ***Duke Energy employees are responsible for accessing flashed insulators during routine aerial inspections.***
- Pin type insulators mounted above crossarms have broken 2 or more broken skirts or the top skirt is broken
- Pin type insulators mounted above crossarms are rolled more than 30 degrees from vertical

3.3.3 **Priority 1** is described as meeting ANY of the conditions listed below and should be scheduled to be replaced:

- Suspension type insulators have advanced pin rust with significant loss of material and/or swelling of the pin base
- Suspension type insulators have more than half of their bells broken.
- Pin type insulators mounted above crossarms have more than half of their skirts broken

Priority 1 Porcelain Spark Erosion
These can be difficult to see/evaluate

Typical Priority 1 “Ball & Socket” Insulator

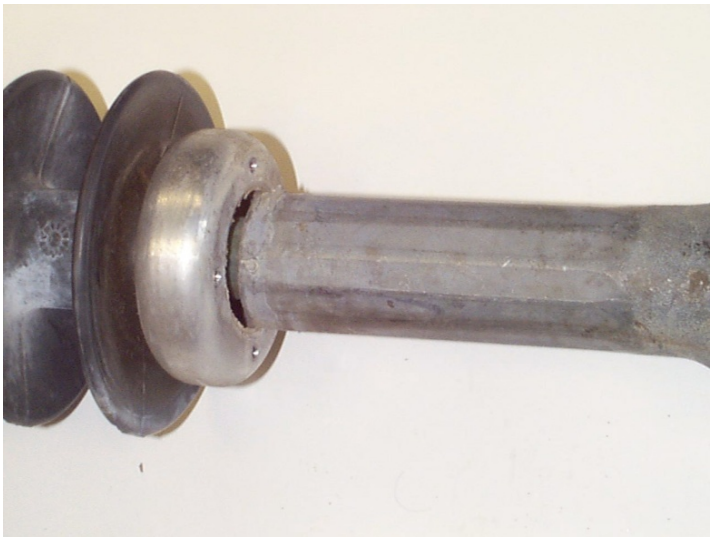
3.4 Transmission Line Polymer Insulators

3.4.1 **Priority 9** is described as meeting any of the conditions listed below. A repair work order will be written.

- Polymer deadend or suspension insulator has either a missing or incorrectly installed corona ring at 138 kV or above (does not apply to line post insulators)

3.4.2 **Priority 2** is described as meeting one or more of the conditions listed below and should be replaced:

- Polymer has an exposed fiberglass rod
- Polymer has open splits or gaps in the rubber housing
- Polymer displays evidence of electrical tracking or leaking interface compound



Priority 2 Polymer Insulator
Exposed Fiberglass Rod (Ohio Brass)

Priority 2 Polymer Insulator
Split Housing (Ohio Brass)

3.4.3 **Priority 1** is described as meeting ANY of the conditions listed below and should be scheduled to be replaced:

- Polymer displays severe damage due to mechanical or electrical reasons

3.5 Transmission Line Conductors & Splices

3.5.1 **Priority 9** is described as meeting the condition listed below and should be repaired:

- Conductor has been shot through any of the aluminum strands
- Conductor aluminum strands are unraveled

3.5.2 **Priority 1** is described as meeting ANY of the conditions listed below and should be scheduled to be repaired or replaced:

- Conductor has been shot through any of the steel strands
- Conductor splice has high infrared readings
- Ohm-stick conductor splice resistance guidelines recommend an immediate replacement

3.6 Transmission Line Overhead Ground Wires (Statics, OHGW, OHG, OPGW)

3.6.1 **Priority 2** is described as meeting ANY of the conditions listed below and should be repaired or replaced:

- Any broken strands
- Static is significantly rusted, corroded, or deeply pitted
- Static is dark brown or black in color
- Static is missing between spans

3.6.2 **Priority 1** is described as meeting ANY of the conditions listed below and should be scheduled to be repaired or replaced:

- Static is broken, detached, on the ground, or laying on a crossarm.

3.7 Transmission Line Switches

3.7.1 **Priority 2** is described as meeting ANY of the conditions listed below and should be repaired:

.

- Mechanical gas targets for interrupter SF6 gas levels are present or SF6 gas gauges are in the red zone
- Switch has known mechanical issues
- Infrared readings are high and require adjustment of blade/jaw interface or replacement
- The switch is tagged out of service with the ECC due to mechanical or operational problems
- Electrical testing indicates that a vacuum interrupter has lost dielectric strength, i.e. vacuum is not present
- Manual operator has been vandalized or Duke Energy lock is missing

SF6 Gas Level on Southern States must be in the Green Region

S&C Target is Normally White
Red Target Indicates Low Gas

3.8 Transmission Line Lattice Towers, Steel & Concrete Poles

3.8.1 **Priority 9** is described as meeting ANY of the conditions listed below. Repairs or replacement may be necessary.

- Concrete poles have rust stains originating from inside the crack from the reinforcing steel or cracks more than ¼ inch wide
- Galvanized or painted steel pole or towers have rust and needs painting
- Groundline treatment on steel poles or tower is cracked, or peeled, but rusting has not yet occurred
- Earth washout at pole base requires mitigation
- Earthen fill has been placed over concrete foundations

3.8.2 **Priority 2** is described as meeting ANY of the conditions listed below. Repairs or replacement may be necessary

- Galvanized or painted steel pole or towers have deep rust, needs cleaning, priming, & painting
- Weathering steel poles or towers exhibit heavy pack-out including deformed or missing members or bolts
- Groundline treatment on steel pole or tower is peeled or missing, and pole is actively rusting
- Groundline tower posts and diagonals exhibiting deep rust or material loss
- Aluminum towers exhibit deformed or missing members or bolts
- Earth washout at pole base is so substantial it requires replacement

3.8.3 **Priority 1** is described as meeting ANY of the conditions listed below and should be scheduled to be replaced:

- Lattice Tower, Steel or Concrete poles have significant damage requiring they be replaced
- Earth washout at pole base possibly compromises the structure integrity

3.9 Transmission Minor Components

3.9.1 **Aerial Marker Balls**; Inspect for partially detached or broken marker balls.

3.9.2 **Arrestors;** Inspect for loose hardware, detached jumpers, cracks, signs of being burned, or with high infrared readings.

3.9.3 **Bird Contamination;** Inspect for bird droppings on porcelain or polymer insulator strings. Significant activity may warrant the installation of protective bird guards or insulator replacement

3.9.4 **Conductor Splices;** Inspect for rusted strands or a discharge of the conductive grease at the splice ends. The color will normally be black. Elevated infrared readings will indicate if the splice is in a critical state. The “Ohmstick” is an effective means of evaluating a splices’ integrity.

3.9.5 **Connections;** Inspect for bent, cracked, or missing hardware, and loose or missing bolts.

3.9.6 **Dampers;** Inspect for bent, cracked, or missing nuts. Look for signs of being broken loose and sliding away from the insulator.

3.9.7 **Distribution Underbuild**; Inspect for obvious hazards and safety concerns such as crossarm integrity, signs of transformer oil spillage, blown insulators, or loose grounds adjacent to primary conductors.

3.9.8 **Grounding;** Inspect for broken or deteriorated pole grounds and for unattached flying taps or bonding straps to the overhead ground wire.

3.9.9 **Guy Strain Insulators;** Inspect coatings for cracking and chipping as they protect the fiberglass insulator rod from ultraviolet radiation. Inspect end fittings for deterioration. Insulators with significantly frayed glass or splintering should be replaced.

3.9.10 **Hairpin Type Conductor Phase Spacers**; Inspect for overall integrity, any broken strands, and signs of collapsing.

3.9.11 **Line Traps;** Inspect for missing or broken nylon nuts used on the long longitudinal bolts holding the trap together as they are UV sensitive and have a history of failure.

3.9.12 **Pole Bands;** Inspect for broken through bolts and pulled out lag screws, particularly on conductor deadends.

3.9.13 **ROW Condition;** Inspect for any leaning tree or hazard that may come in contact with the line.

3.9.14 **U-bolts used on steel crossarms;** Inspect for broken U-bolts, particularly on lines with large conductors. Particular attention should be given to all weathering U-bolts as significant rusting and section loss often occurs at the crossarm attachment.

3.9.15 **Chevrons and Marker Balls;** Inspect for faded, detached or missing chevrons and hazard balls. Insure the orange and yellow marker balls used as warning devices for helicopter patrols are present at all line crossings.

4.0 Revision History

Revision	Date	Description
002	3/2017	Revised Corrective Maintenance Priority Codes to match new standard guidance.
003	12/2019	Added section 1.2.2 Revised Transmission Lattice Towers, Steel, & Concrete Poles Priority Codes to match new guidance

Document Approval Form

issued 1/30/2020

Section A: Document identification and type of action (Instructions for completing form on page 2)

Document no.: TECP-MIM-TRM-00026 | Revision no.: 003

Document title: Transmission Line Material Condition Assessment Procedure; Ground Patrols

Applies to: (Select all that apply)

- [x] Duke Energy
- [ ] Duke Energy Carolinas, LLC
- [ ] Duke Energy Progress, LLC
- [ ] Duke Energy Florida, LLC
- [ ] Duke Energy Indiana, LLC
- [ ] Duke Energy Kentucky, Inc.
- [ ] Duke Energy Ohio, Inc.
- [ ] Group _____
- [x] Department Transmission - All Regions
- [ ] Other _____

Type of action:

- [ ] New
- [x] Revision
- [ ] Periodic review completed
- [x] Ownership Change
- [ ] Cancellation
- [ ] Suspension
- [ ] Renumber

Periodic Review cycle: (Default is 2-year)

- [ ] 1-Year
- [x] 2-Year
- [ ] 3-Year
- [ ] 4-Year
- [ ] 5-Year

Compliance Applicability: (required field)

- [x] None
- [ ] NERC
- [ ] State Codes/Standards
- [ ] FERC Standards of Conduct
- [ ] Patriot Act
- [ ] Sarbanes-Oxley
- [ ] HIPAA
- [ ] OSHA _____
- [ ] Other _____

- [ ] Communication plan established
- [ ] Impact Reviews completed

For Doc. Mgmt staff use only:

- [ ] Editorial Change
- [ ] Control element revision

_____
(does not require approval signature)

Security Restrictions Required: [ ] Yes [ ] No If yes, explain _____

Document Collection name(s): (Not Required - A unique grouping of like documents.)

Complete if submitting a form for publication:

Does the form have a parent, governing or instructional procedure? [ ] No [ ] Yes (Procedure No: _____)

How is the form to be completed or used? [ ] Hard Copy (completed by hand) [ ] Online Data Entry (fillable PDF)

Description of document action or summary of changes:
Revision changes adding section 1.2.2.
Revised Transmission Lattice Towers, Steel, & Concrete Poles Priority Codes to match new guidance

Section B: Approval **Who should sign?** see instructions on page 2

Author(s)/Writer(s)/Preparer(s) (*signature not required*):
Tyler Johnson

Approval recommended *(print name)*:	*(signature)*	Date:
Approval recommended *(print name)*:	*(signature)*	Date:
Approval recommended *(print name)*:	*(signature)*	Date:
Final Approval *(print name)*:	*(signature)* Andrew Adldoost Digitally signed by Andrew Adldoost Date: 2020.01.29 18:30:56 -05'00'	Date: 01-29-2020

Return signed form as a PDF to TransDocumentMgmt@duke-energy.com.

Keywords: procedures and forms; procedures program; DAF; ADMP-PRO-TRM-00016; document management program
Applies to: Duke Energy - Transmission; Enterprise Operational Excellence

ATTACHMENT L

Matthew R. Bernier
ASSOCIATE GENERAL COUNSEL

February 28, 2022

VIA ELECTRONIC FILING

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

Re: *2021 Annual Wood Pole Inspection Report; Undocketed*

Dear Mr. Teitzman;

Pursuant to Order Numbers PSC-06-0144-PAA-EI and PSC-07-0918-PAA-PU, please find enclosed Duke Energy Florida, LLC's ("DEF") Annual Wood Pole Inspection Report for CY 2021. This information is also contained in DEF's 2021 Annual Service Reliability Report dated February 28, 2022.

Thank you for your assistance in this matter. Please feel free to call me at (850) 521-1428 should you have any questions concerning this filing.

Sincerely,

/s/ Matthew R. Bernier

Matthew R. Bernier

MRB/cmw
Enclosure

cc: Penelope Buys, FPSC Division of Engineering

106 East College Avenue, Suite 800 ▪ Tallahassee, Florida 32301
Phone: 850.521.1428 ▪ Fax: 727.820.5041 ▪ Email: matthew.bernier@duke-energy.com

Duke Energy Florida (Distribution)
Annual Wood Pole Inspection Report
(Reporting Year 2021)

a	b	c	d	e	f	g	h	i	j	k	l	m
Total # of Wooden Poles in the Company Inventory	# of Pole Inspections Planned this Annual Inspection	# of Poles Inspected this Annual Inspection	# of Poles Failing Inspection this Annual Inspection	Pole Failure Rate (%) this Annual Inspection	# of Poles Designated for Replacement this Annual Inspection	Total # of Poles Replaced this Annual Inspection	# of Poles Requiring Minor Follow-up This Annual Inspection	# of Poles Overloaded this Annual Inspection	Method(s) V = Visual E = Excavation P= Prod S = Sound B= Bore	# of Pole Inspections Planned for Next Annual Inspection Cycle	Total # of Poles Inspected (Cumulative) in the 8-Year Cycle to Date	% of Poles Inspected (Cumulative) in the 8-Year Cycle to Date
821,080	100,000	121,224	1,163	0.96%	720	2,251	2,267	N/A	V, E, S, B, P	100.000	792,736	96.5%
If b - c > 0, provide explanation	N/A											
If d - g > 0, provide explanation	N/A											
Description of selection criteria for inspections	Poles for inspection, in 2021, were chosen based on geographic location to complete cycle 2.											

- Poles noted in column "d" are for ground-line rejects only. Additional poles are replaced based on pole-top issues but are not included in this number.
- Failure rate in column "e" is for ground-line rejects only.

Duke Energy Florida, LLC (Transmission)
Annual Wood Pole Inspection Report
(Reporting Year 2021)

a	b	c	d	e	f	g	h	i	j	k	l	m
Total # of Wooden Poles in the Company Inventory	# of Pole Inspections Planned this Annual Inspection (W)	# of Poles Inspected this Annual Inspection (W)	# of Poles Failing Inspection this Annual Inspection (W)	Pole Failure Rate (%) this Annual Inspection	# of Poles Designated for Replacement this Annual Inspection	Total # of Poles Replaced this annual Inspection	# of Poles Requiring Minor Follow-up this Annual Inspection	# of Poles Overloaded this Annual Inspection	**Method(s)** V=Visual E=Excavation P= Prod S=Sound & B=Bore R=Resistograph	# of Poles Inspections Planned for Next Annual Inspection Cycle	Total # of Poles Inspected (cumulative in the 8-Year Cycle to Date	% of Poles Inspected (Cumulative) in the 8-Year Cycle to Date
16,729	5,043	3,531	1,111	31.46%	1,495	1,271 Total: 766 + 334 = 1111	162	37	V = 13,329 (W,S,C) S&B = 3,860 (W) V(S) = 425 (LT) 13,754 = Total V Total Structures, includes LT Total S&B = 3860	1,560 (W)	Inspected 14 = 4,891 Inspected 15 = 5,856 Inspected 16 = 2,280 Inspected 17 = 1,902 Inspected 18 = 923 Inspected 19 = 4,545 Inspected 20 = 3,371 Inspected 21 = 3,860 Total = 27,628	165.15%

If b - c > 0, provide explanation	DEF Transmission visually inspects transmission lines with wood poles on 4 year cycle; estimating 'Planned Inspection-S&B' target based on 1/3 of the remaining balance; actual inspected equates to ~ 1/4 of balance (double the 1/8 requirement for S&B).
If d - g > 0, provide explanation	Inspections were completed thru the end of the year. Some poles found to have 'failed' in 2021 were replaced in 2021, while others have been prioritized and worked into schedule for 2022. Defective/failed poles found in late 2021 are prioritized and worked into schedule for 2022; *1,027 were wood replaced within Maintenance (705) & DOT/Relo/Upgrades/Additions (322) for 2021.
Description of Selection Criteria for Inspections	DEF Transmission conducts Sound & Bore on wood poles on an 8-year cycle as per FPSC ruling. *DEF has been working toward data true up – as stated in past Reliability Reports – to remain compliant with report due dates and still be responsive in reporting; DEF is providing updated S&B data (previous data may have included all inspections). DEF visually inspects Transmission lines with Steel or Concrete Poles and Lattice Towers on a 6-year cycle. DEF visually inspects Transmission lines containing wood poles on a 4-year cycle; estimating 'Planned Inspection-S&B' targeting 1/3 of wood pole remaining balance; Actuals completed at 1/4 of remaining balance. DEF's Annual Service Reliablity Report Inspection criteria is included in: Attachment K-Transmission Wood pole Inspection-TECP-MIM-TRM-00118-Rev.001 and Attachment M-Ground Patrols-2021-TECP-MIM-TRM-00026-Rev.003 * Type: W-Wood; S-Steel; C-Concrete; LT-Lattice Tower

Duke Energy Florida
CCA Pole Sampling Results (Less than 16 Years of Age)
(Reporting Year 2021)

a	b	c	d	e	f	g	h	i	j	k	l	m
Total # of CCA Poles Less than 16 Years of Age in the Company Inventory	Total # of Pole Inspections Planned this Annual Inspection	# of CCA Poles Less than 16 years of age Inspected this Annual Inspection	# of CCA Poles Less than 16 years of age sampled this Annual Inspection	# of CCA Poles Less than 16 Years of Age Failing Inspection this Annual Inspection	CCA Poles Less than 16 Years of Age Failure Rate (%) this Annual Inspection	# of CCA Poles Less than 16 Years of Age Designated for Replacement this Annual Inspection	Total # of Poles Replaced this Annual Inspection	# of CCA Poles Less than 16 Years of Age Requiring Minor Follow-up This Annual Inspection	# of Poles Overloaded this Annual Inspection	Method(s) V = Visual E = Excavation P= Prod S = Sound B= Bore	# of Pole Inspections Planned for Next Annual Inspection Cycle	Total # of Poles Inspected (Cumulative) in the 8-Year Cycle to Date
120,264	100,000	35,784	946	3	0.3%	3	N/A	448	N/A	V, E, S, B, P	N/A	N/A
If b - c > 0, provide explanation	N/A											
If d - g > 0, provide explanation	N/A											
Description of selection criteria for inspections	CCA poles to experience full inspection are randomly selected to represent a quantity of 1% or more of the total CCA poles less than 16 years of age in the inspection zone.											

ATTACHMENT M

2021 DEF DISTRIBUTION POLE INSPECTION DATA

PROVIDED ON CD

ATTACHMENT M

2021 FLORIDA POLE INSPECTION DATA

PROVIDED ON CD

ATTACHMENT M

2021 DEF TRANSMISSION POLE INSPECTION DATA

PROVIDED ON CD