



Matthew R. Bernier
ASSOCIATE GENERAL COUNSEL

April 18, 2019

VIA ELECTRONIC MAIL

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

Re: *Review of 2019-2021 Storm Hardening Plan, Duke Energy Florida, LLC;
Docket No. 20180146-EI*

Dear Mr. Teitzman:

Please find attached for filing Duke Energy Florida, LLC's Response to Staff's Third Data Request (Nos. 1-12) in the above-referenced Docket.

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 matter.

Respectfully,

/s/ Matthew R. Bernier

Matthew R. Bernier

MRB/cmkn
Attachment

cc: Parties of Record

CERTIFICATE OF SERVICE

I HEREBY CERTIFY that a true and correct copy of the foregoing has been furnished to the following by electronic mail this 18th day of April, 2019, to all parties of record as indicated below.

/s/ Matthew R. Bernier

Attorney

<p>J. Crawford / J. Nieves Office of General Counsel Florida Public Service Commission 2540 Shumard Oak Blvd. Tallahassee, FL 32399-0850 jcrawfor@psc.state.fl.us jnieves@psc.state.fl.us</p>	<p>J. R. Kelly / P. Christensen Office of Public Counsel c/o The Florida Legislature 111 West Madison Street, Room 812 Tallahassee, FL 32399 kelly.jr@leg.state.fl.us christensen.patty@leg.state.fl.us</p>
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**Duke Energy Florida, LLC's Response to Staff's Third Data Request
re. Review of 2019-2021 Storm Hardening Plan (Nos. 1-12)**

Docket No. 20180146-EI

National Electric Safety Code (NESC) Compliance

- 1) Please refer to pages 4 and 5.
 - a. What NESC construction grade does DEF use for its distribution and transmission facilities?
 - b. Does DEF use the same NESC construction grade for new construction and replacement or relocation of distribution and transmission facilities?
 - c. Does DEF use different NESC construction grades for different situations? If yes, please explain.
 - d. What is the weakest NESC construction grade that DEF uses for new construction and replacement of its distribution and transmission facilities?
 - e. Why is DEF considering that the NESC does not call for the extreme wind design standard for distribution poles that are less than sixty feet in height?
 - f. What version of PoleForeman does DEF use to design the distribution and transmission supporting structures?
 - i. Does PoleForeman comply with the 2017 NESC?
 - ii. Does the software's operator need to know the 2017 NESC code to enter the correct information into PoleForeman? Example: Input the correct Basic Wind Speed as specified by Figure 250-2 of the 2017 NESC into the software.

RESPONSE:

- a. DEF Transmission utilizes Grade B construction grade.
DEF Distribution utilizes Grade C construction at all locations except locations where Grade B is required per NESC section 242.
- b. DEF Transmission utilizes Grade B construction grade for new construction, replacements, and relocations.
DEF Distribution-Yes.
- c. DEF Transmission does not utilize different NESC construction grades for different situations.

DEF Distribution utilizes Grade C construction at all locations except locations where Grade B is required per NESC section 242 such as railroad, limited access highways and navigable water way crossings. In addition to meeting Grade C or Grade B, structures in excess of 60ft above ground are also designed to meet the requirements of NESC rule 250C – Extreme wind loading.

- d. DEF Transmission does not utilize construction grades weaker than NESC Grade B. DEF Distribution utilizes Grade C where allowed by the NESC.
- e. DEF Transmission-non/applicable
NESC rule 250C – Extreme Wind loading states “If no portion of a structure or its supported facilities exceed 18m (60ft) above ground or water level, the provisions of this rule are not required, except as specified in Rule 261A1c, 261A2e, or 261A3d. All distribution poles meet the loading requirements of Rule 261A1c, 261A2e, or 261A3d for extreme wind.
- f. DEF Transmission does not utilize PoleForeman.
DEF Distribution-7.0.8
 - i. DEF Transmission -Non -applicable.
DEF Distribution-Yes.
 - ii. DEF Transmission-Non -applicable.
DEF Distribution-PoleForeman defaults to Grade C with rule 250B loadings. If the operator needs to build to Grade B, they make that selection. If the operator needs to build to 250C Extreme wind loadings, then they must select the wind speed based on Figure 250-2. Figure 250-2 is included in our construction specifications

Extreme Wind Loading (EWL) Standards

- 2) Please refer to pages 4 through 6.
 - a. Is DEF applying any safety (load or strength) factor to exceed the NESC minimum requirements?
 - b. How does DEF comply with the 2017 NESC? Please explain the process of how the supporting structures are designed. Is the extreme wind loading calculated before the pole strength for wind?
 - c. Please provide the height of DEF's transmission and distribution wood poles?

RESPONSE:

- a. DEF Transmission exceeds NESC Wind Loadings by utilizing DEF’s Procedure STDP-STD-TRM-00077 - Rev. 000 (Extreme Wind Guidelines). This does not involve the use of applying safety factors.
DEF Distribution-No-DEF designs to meet or exceed the basic requirement of the NESC.

- b. DEF Transmission utilizes the PLS CADD software suite for Transmission line design which includes design parameters associated with DEF’s Extreme Wind Guideline (DEF Procedure STDP-STD-TRM-00077 - Rev. 000). Once transmission circuit and structure parameters are established, poles strengths are designed to exceed DEF’s Extreme Wind Guidelines.
DEF Distribution-As stated in the DEF Construction Manual:
“Poleforeman is a computer program written by Power Line Technology Inc. Its function is classing poles, calculating guy wire tensions and performing joint use analysis to help assure compliance with a company's standards and the National Electrical Safety Code (NESC). Duke Energy has adopted this program as its standard tool for this purpose. The Standards Department has created and maintains templates for use in the program. A template represents a basic specification with the relative conductor and guy locations preset. The user must provide span lengths, guy leads, equipment characteristics, and any additional conductors or attachments. The program utilizes this information and accurately calculates the mechanical loading on the pole and guys based on the loading requirements of section 25 of the NESC. It then compares the loads to the American National Standards Institute (ANSI) standard capabilities of the poles and guys to assure compliance with the strength requirements of section 26 of the NESC.”

- c. DEF Transmission pole heights vary based on project need and typically range from 65’ to 120’ above grade.
DEF Distribution-Standard ANSI pole sizes in increments of 5’ from 30’ to 100’ are available; however, it is rare a pole more than 60’ in length is used.

Mitigation of Flooding and Storm Surge Damage

- 3) Please refer to page 7.
 - a. Has DEF adopted and/or implemented any new procedure to build underground distribution to mitigate damage due to flooding and Storm Surges?

 - b. The 2016 Storm Hardening plants indicated that DEF has used its prioritization model to identify areas where certain mitigation projects were going to 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. Please provide the stainless-steel equipment, submersible connectors, raised mounting

boxes, could shrink sealing tubes and submersible secondary blocks test results. Also, please explain your findings.

- c. Has DEF learned any lessons from previous underground projects? If yes, please explain the lessons learned.
- d. Does DEF consider the terrain's characteristics, soil consistency, historical data and FEMA flooding maps when selecting the Storm hardening underground project selection? Please explain.

RESPONSE:

- a. Please see section 33 of the Distribution Standards Manual for details on water resistant specifications.
- b. See answer a. In regard to findings, DEF has not had any reported problems from the connections.
- c. Yes. Following Hurricane Michael, multiple pad mounted transformers that had been raised to resist flooding at Alligator Point and St. George Island were pushed off their fiberglass pads because of the storm surge. DEF is reviewing its current specifications to determine if other solutions exist.
- d. DEF selects storm hardening underground projects based on performance during previous storms as well as terrain's characteristics.

The above questions do not apply to DEF Transmission.

Deployment Strategies

- 4) Please refer to page 9. When will the new software technology be incorporated in DEF's prioritization model?

RESPONSE:

DEF will use the ESRI ArcGIS software in its 2020 work plan development
The above question does not apply to DEF Transmission.

- 5) Please refer to page 10. Does the Targeted Underground Program include converting overhead feeders or overhead laterals or both to underground facilities?

RESPONSE:

The Targeted underground program is focused on converting overhead laterals to underground facilities.

The above question does not apply to DEF Transmission.

- 6) Please refer to pages 9 through 12.
- a. Are the Base Programs listed on pages 11 through 12 included in DEF's Grid Investment Plan?
 - b. Some of the Base programs listed in the 2016-2018 plan are not included in the 2019-2021 plan. Are those programs complete?

RESPONSE:

- a. The programs listed on pages 11 through 12 are not a part of the Grid Investment Plan (GIP).
- b. The programs that were previously listed in the 2016-2018 plan that are not listed on the 2019-2021 plan still exist, however DEF does not have any projects currently identified in those programs.

The above questions do not apply to DEF Transmission.

- 7) Please refer to page 14. For the 2019-2021 plan, DEF changed some the questions that are asked in the determination of the Utility's hardening projects. Why did DEF replace the questions about CAIDI and momentaries with questions about SAIDI and SAIFI?

RESPONSE:

CAIDI is a function of SAIDI and SAIFI, by focusing on SAIDI and SAIFI DEF is able to drive performance improvements in CAIDI. DEF removed the momentary question from the developmental process because DEF's storm hardening approach is to reduce sustained outages and restoration times during major events.

The above question does not apply to DEF Transmission.

- 8) Please refer to page 15. DEF provided "a sampling of the proposed" storm hardening projects for 2019 through 2021. Please provide a complete list of the proposed storm hardening projects for 2019.

RESPONSE:

DEF continuously creates projects year around based on reliability performance and opportunities identified in the field. These projects are continuously prioritized based on the criteria provided in the storm hardening plan. The sampling of projects provided

represents a good subset of the different programs considered under storm hardening and locations throughout DEF's territory that are anticipated to be completed in the next 3 years.

The above question does not apply to DEF Transmission.

- 9) Please refer to page 16. Please confirm that SOG means Self-Optimizing Grid and TUG means Targeted Underground Program.

RESPONSE:

Yes, SOG means Self-Optimizing Grid and TUG means Targeted Underground.
The above question does not apply to DEF Transmission.

Ten Initiatives

- 10) Please refer to Attachment B, page 65 of DEF's 2018 PSC Reliability Report Excerpts. What is the estimated completion date for all of DEF's overhead transmission data to be input into GIS?

RESPONSE:

The existing transmission line assets, as of end of 2017, are in GIS. Work is underway to have the remaining transmission line assets inputted to GIS by end of 2020.

- 11) Please provide an overview of Initiatives Six through Ten as was provided for Initiatives One through Five in Attachment B.

RESPONSE:

Please see the attached pages 68 through 86 from DEF's 2018 Annual Reliability Report and Transmission Storm Forensic Analysis Specifications.

- 12) Please complete the table attached.

RESPONSE:

Please see the table below.

Activity	Any change from current plan. (Y/N)*	Actual Cost									Estimated Cost									
		2016			2017			2018			2019			2020			2021			
		O&M	Capital	Total	O&M	Capital	Total	O&M	Capital	Total	O&M	Capital	Total	O&M	Capital	Total	O&M	Capital	Total	
8-Year Wooden Pole Inspection Program	N	\$3.9M		\$3.9M	\$4.5M		\$4.5M	\$3.9M		\$3.9M	\$4.0M		\$4.0M	\$4.2M		\$4.2M	\$4.3M		\$4.3M	
10 Storm Hardening Initiatives																				
1	A Three-Year Vegetation Management Cycle for Distribution Circuits	N	\$29.6M	\$1.2M	\$30.8M	\$28.9M	\$8.5M	\$29.7M	\$35.9M	\$1.6M	\$37.5M	\$49.3M	\$1.2M	\$50.5M	\$53M	\$1.2M	\$54.2M	\$45.3M	\$1.3M	\$46.6M
2	An Audit of Joint-Use Attachment Agreements	N	\$438K		\$438K	\$44K		\$44K	\$442K		\$442K	\$440k		\$440K	\$438K		\$438K	\$442K		\$442K
3	A Six-Year Transmission Structure Inspection Program		7,568K		7,568K	6,893K		6,893K	7,911K		7,911K	8,250K		8,250K			TBD			TBD
4	Hardening of Existing Transmission Structures			110,473K	110,473K		109,829k	109,829K		185,614K	185,614K		160,188K	160,188K			TBD			TBD
5	Transmission and Distribution GIS				N/A			N/A						N/A			N/A			N/A
6	Post-Storm Data Collection and Forensic Analysis	20,000-TX		20,000-T	44,150-TX			44,150-TX	\$169k-D 94,250-TX		\$169k-D 94,250-TX	\$257.5k-D		\$275.5k-D N/A -TX			N/A-TX			N/A-TX
7	Collection of Detailed Outage data Differentiating Between the Reliability Performance of Overhead and Underground Systems																			
8	Increased Utility Coordination with Local Governments																			
9	Collaborative Research on Effects of Hurricane Winds and Storm Surge																			
10	A Natural Disaster Preparedness and Recovery Program **				N/A			N/A			N/A			N/A			N/A			N/A
Totals																				
Any Other Key Elements or Proposed Initiatives																				

* Please explain any changes from the current plan

** Please provide a copy of the disaster plan

Items 5, 7, 8, 9 and 10 are all a part of DEF's normal business and DEF does not track or project the costs associated with these Initiatives.

** Please see DEF's Annual Service Reliability Report for the Disaster

Zone	Op Center	County	Project	Sub Category
South Central	Winter Garden	Orange	Oakland Ave Feeder Tie	Feeder Tie
South Coastal	St Petersburg	Pinellas	16th St. X43/X46 4/0 copper to 795 AAC reconductor	Feeder Tie
South Central	Highlands	Highlands	US 27 & Hammock Rd	Feeder Tie
South Central	Highlands	Highlands	US 27 & Lakeview Rd Phase II	Feeder Tie
South Central	Highlands	Highlands	State HWY 66 Phase I	Feeder Tie
South Central	Highlands	Highlands	State HWY 66 Phase II	Feeder Tie
South Central	Highlands	Highlands	Lakewood Ave	Feeder Tie
North Coastal	Ocala	Marion	Ocala - SE 64th Ave Rd	Feeder Tie
North Coastal	Monticello	Taylor	Perry North N15 - Reconductor	Feeder Tie
South Coastal	Seven Springs	Pasco	Denham C151_Denham C152 Feeder Tie	Feeder Tie
North Coastal	Monticello	Alachua	High Springs A16	Deteriotated Conductor
North Coastal	Monticello	Columbia	Ft White A20, West US 27 Reconductor	Feeder Tie/Deteriotated Conductor
South Central	Buena Vista	Orange	Hunters CK_Town Ctr Feeder Tie	Feeder Tie
South Central	Lake Wales	Polk	K9 & K5078 Feeder Tie	Feeder Tie
North Coastal	Inverness	Citrus	Storm Hardening UG Xfms at Sportsman Riverside Townhouses, Homosass	Submersible UG
North Coastal	Inverness	Citrus	Storm Hardening Gasparilla Cay Subdivision	Submersible UG
North Coastal	Inverness	Citrus	Storm Hardening along Riverhaven Dr., Homosassa	Submersible UG
North Coastal	Inverness	Citrus	Storm Hardening Dixie Shores Subdivision, Crystal River.	Submersible UG
North Coastal	Inverness	Citrus	Storm Hardening Blue River Cove Subdivision, Homosassa	Submersible UG
South Coastal	Seven Springs	Pasco	Anclote Substation Bank 7 and Bank 8 Feeder Ties	Feeder Tie
South Central	SE Orlando	Orange	GreenTree & Cypress Glenn Grid Strenghtening - Phase 1	OH to UG Conversion
South Central	SE Orlando	Orange	GreenTree & Cypress Glenn Grid Strenghtening - Phase 2	OH to UG Conversion
North Coastal	Inverness	Hernando	Storm Hardening Imperial Estates Underground	Submersible UG
South Central	Highlands	Highlands	Lake Byrd Reconductor	Deteriotated Conductor
North Coastal	Monticello	Alachua	GE Alachua A186, UF Dairy Reconductor	Deteriotated Conductor
South Coastal	Zephyrhills	Pasco	Branchline reconductor at Otis Allen and 16th St.	Deteriotated Conductor
South Central	Lake Wales	Polk	Alturas Loop Rd	Deteriotated Conductor
South Central	Highlands	Highlands	K542 Sebring Airport Terminal	Deteriotated Conductor
North Central	Deland	Volusia	W902 Shaw Lake Reconductor	Deteriotated Conductor
South Central	SE Orlando	Orange	Dawn Drive 5081648-2	Deteriotated Conductor
North Coastal	Inverness	Citrus	Citrus Springs - Construct 3 phs 1/0 along Academy Dr & 69kv R/W and eliminate bac	Backlot to Frontlot Conversion
North Central	Longwood	Seminole	Fern Park M908 Grid Strenghtening	OH to UG Conversion
South Coastal	Clearwater	Pinellas	Clearwater C15 Country Club Subdivision	Deteriotated Conductor
South Coastal	Seven Springs	Pinellas	Curlew C4988 Spanish Acres Subdivision	Deteriotated Conductor
South Central	Winter Garden	Orange	Main Street Feeder Tie	Feeder Tie
South Central	Buena Vista	Orange	Summerlake Park Feeder Tie K1111 to K1110	Feeder Tie
South Coastal	Clearwater	Pinellas	TUG 444175916 KENT PL	TUG
South Coastal	Seven Springs	Pasco	TUG 445908443 US HWY 19	TUG
South Coastal	Walsingham	Pinellas	TUG 444000345 WALSINGHAM ROAD	TUG
South Central	Lake Wales	Polk	TUG 443456879 MASTERPIECE ROAD	TUG
South Coastal	Clearwater	Pinellas	TUG 444175903 LAKE AVENUE	TUG
North Coastal	Monticello	Jefferson	TUG 442991482 DILLS RD	TUG
North Coastal	Monticello	Jefferson	TUG 442991979 CLARK RD	TUG
North Coastal	Monticello	Jefferson	TUG 442992222 DILLS RD	TUG
North Coastal	Monticello	Jefferson	TUG 442991596 E CAPPS HWY	TUG
North Coastal	Monticello	Jefferson	TUG 442992262 WAUKEENAH HWY	TUG
North Coastal	Monticello	Jefferson	TUG 442992343 E WASHINGTON ST	TUG
North Coastal	Monticello	Jefferson	TUG 442991942 E WASHINGTON ST	TUG
North Coastal	Monticello	Jefferson	TUG 442992071 E WASHINGTON ST	TUG
South Central	Lake Wales	Polk	TUG 443588618 W CENTRAL AVENUE	TUG
South Central	Lake Wales	Polk	TUG 443590662 WAVERLY ROAD	TUG
South Coastal	Walsingham	Pinellas	TUG 444000839 PARK BLVD	TUG
South Central	Lake Wales	Polk	TUG 443456476 S 4TH STREET	TUG
South Coastal	St Petersburg	Pinellas	TUG 443021560 13TH AVENUE SOUTH	TUG
North Coastal	Monticello	Hamilton	TUG 437462847 SW 41 HWY	TUG
North Coastal	Monticello	Jefferson	TUG 442991852 WAUKEENAH HWY	TUG
North Coastal	Monticello	Madison	TUG 446863601 S STATE ROAD 53	TUG
North Coastal	Monticello	Taylor	TUG 437643458 Johnson Stripling Rd	TUG
North Central	Deland	Volusia	TUG 443101071 S WOODLAND BLVD	TUG
North Coastal	Monticello	Levy	TUG 437808024 SE 4 ST	TUG
North Coastal	Monticello	Taylor	TUG 437643315 MORGAN WHIDDON RD	TUG
North Coastal	Monticello	Levy	TUG 437808132 OLD FANNIN RD	TUG
North Central	Deland	Volusia	TUG 443101171 E TAYLOR ROAD	TUG
North Coastal	Inverness	Hernando	TUG 446551406 CORTEZ BLVD	TUG
North Coastal	Inverness	Hernando	TUG 446551579 OAKDALE AVENUE	TUG
North Central	Deland	Volusia	TUG 443098247 MERCERS FERNERY ROAD	TUG
North Coastal	Inverness	Citrus	TUG 446947221 N CAROLWOOD PT	TUG
South Central	Clermont	Lake	TUG 439153957 OLD HWY 50	TUG
North Coastal	Inverness	Citrus	TUG 446948589 N.FOREST LAKE DR	TUG
North Coastal	Inverness	Hernando	TUG 446551410 SINGER LANE	TUG
North Coastal	Inverness	Hernando	TUG 446551438 KOLLAR STREET	TUG
North Coastal	Inverness	Hernando	TUG 446551561 CEDAR LANE	TUG
North Central	Deland	Volusia	TUG 443098221 W WASHINGTON AVE	TUG
South Coastal	Walsingham	Pinellas	TUG 444121088 US HWY 19 N	TUG
North Coastal	Inverness	Hernando	TUG 446551401 BROAD STREET	TUG
North Coastal	Inverness	Hernando	TUG 446551571 PONCE DE LEON BLVD	TUG
North Coastal	Inverness	Citrus	TUG 410077868 NE 9TH AVENUE	TUG
North Central	Deland	Volusia	TUG 443098818 CHURCH STREET	TUG
North Coastal	Inverness	Marion	TUG 446792563 SW HWY 484	TUG
North Coastal	Inverness	Marion	TUG 446792833 S US HWY 41	TUG
North Coastal	Inverness	Hernando	TUG 446550669 GARDEN STREET	TUG
North Coastal	Inverness	Citrus	TUG 440373184 W FORT ISLAND TRAIL	TUG
North Coastal	Inverness	Citrus	TUG 446947915 NORVELL BRYANT HWY	TUG
North Coastal	Inverness	Hernando	TUG 446550461 BELL AVENUE	TUG

North Coastal	Inverness	Citrus	TUG 446946957 S RUSSELL ROAD	TUG
North Coastal	Inverness	Citrus	TUG 446946764 S JUNEAU POINT	TUG
North Coastal	Inverness	Hernando	TUG 446551358 SPRING HILL DR	TUG
North Coastal	Monticello	Taylor	TUG 437643271 Johnson Stripling Rd	TUG
North Coastal	Monticello	Madison	TUG 446928406 NE County Road 255	TUG
North Coastal	Inverness	Citrus	TUG 446946878 S. SCARBORO AVENUE	TUG
North Coastal	Inverness	Hernando	TUG 446551368 AYERS ROAD	TUG
North Coastal	Ocala	Marion	TUG 446640224 NE 21ST CT	TUG
North Coastal	Ocala	Marion	TUG 446639397 E HIGHWAY 329	TUG
North Coastal	Monticello	Madison	TUG 446928171 NE State Road 6	TUG
South Coastal	Clearwater	Pinellas	TUG 444040631 McMullen Booth Rd	TUG
North Central	Deland	Volusia	TUG 443101562 REYNOLDS ROAD	TUG
North Central	Longwood	Orange	TUG 442901716 DR LOVE DR	TUG
North Coastal	Monticello	Jefferson	TUG 442991535 Jefferson Heights Rd	TUG
North Coastal	Monticello	Jefferson	TUG 442991614 BONNET POND RD	TUG
North Central	Longwood	Seminole	TUG 442900787 KOKOMO LOOP	TUG
North Coastal	Inverness	Hernando	TUG 446550619 W JEFFERSON STREET	TUG
South Coastal	Zephyrhills	Pasco	TUG 444106863 3RD AVENUE	TUG
North Central	Deland	Volusia	TUG 443098179 S HAYDEN RD	TUG
North Coastal	Monticello	Lafayette	TUG 445194353 NE CRAWFORD ST	TUG
North Coastal	Monticello	Jefferson	TUG 442991878 N. Jefferson St	TUG
North Coastal	Monticello	Jefferson	TUG 442992412 N. Jefferson St	TUG
North Coastal	Monticello	Jefferson	TUG 442992444 WILLIAM FLOYD RD	TUG
North Central	Longwood	Orange	TUG 442726346 INDIANA AVENUE	TUG
North Coastal	Inverness	Citrus	TUG 446793174 E BRADFORD LANE	TUG
North Coastal	Monticello	Lafayette	TUG 445194165 E MAIN ST	TUG
North Coastal	Inverness	Citrus	TUG 440372700 W. HALLS RIVER ROAD	TUG
North Central	Deland	Volusia	TUG 442972314 MILLS COURT	TUG
South Coastal	Seven Springs	Pasco	TUG 445971300 BAZSULY CT	TUG
North Coastal	Monticello	Madison	TUG 446928362 E. US Highway 90	TUG
North Coastal	Inverness	Hernando	TUG 446550648 ROOSEVELT AVENUE	TUG
North Coastal	Monticello	Madison	TUG 446928127 NE COLIN KELLY HWY	TUG
North Coastal	Monticello	Madison	TUG 446928477 E. US Highway 90	TUG
North Central	Deland	Volusia	TUG 442972575 RAINTREE CIRCLE	TUG
North Coastal	Monticello	Levy	TUG 442992069 Nash Rd	TUG
North Coastal	Monticello	Taylor	TUG 437643658 S. Warner Ave	TUG
North Coastal	Monticello	Wakulla	TUG 446034297 Sopchoppy Hwy	TUG
North Coastal	Inverness	Citrus	TUG 440372992 N CARLEEN TERRACE	TUG
North Central	Deland	Volusia	TUG 442972886 MARSH ROAD	TUG
North Coastal	Monticello	Jefferson	TUG 442991542 Indian Hills Rd	TUG
North Coastal	Monticello	Jefferson	TUG 442992157 Indian Hills Rd	TUG
North Coastal	Monticello	Wakulla	TUG 446133723 PORT LEON DR	TUG
North Coastal	Ocala	Sumter	TUG 442170847 CR 567	TUG
North Coastal	Monticello	Taylor	TUG 437643566 JOHNSON STRIPLING RD	TUG
North Coastal	Ocala	Sumter	TUG 442171308 N US HWY 301	TUG
North Coastal	Monticello	Jefferson	TUG 442992140 E. Capps Hwy	TUG
North Coastal	Monticello	Jefferson	TUG 442992370 BOSTON HWY	TUG
North Coastal	Ocala	Marion	TUG 446639202 NW 75TH AVE	TUG
North Coastal	Inverness	Citrus	TUG 446948748 E. OLIVE LANE	TUG
North Coastal	Inverness	Citrus	TUG 446948512 N TRUCKS AVENUE	TUG
South Coastal	Seven Springs	Pinellas	TUG 445909816 ORANGE ST	TUG
North Coastal	Monticello	Wakulla	TUG 446034704 Rock Rd	TUG
South Coastal	Walsingham	Pinellas	TUG 444000493 80TH AVENUE NORTH	TUG
South Coastal	Clearwater	Pinellas	TUG 444176622 MARIVA AVENUE	TUG
North Coastal	Ocala	Marion	TUG 443823907 SE 117TH PLACE	TUG
South Coastal	Walsingham	Pinellas	TUG 444121839 S BELCHER RD	TUG
North Central	Deland	Volusia	TUG 443101583 HAMILTON AVENUE	TUG
North Coastal	Ocala	Marion	TUG 446637870 NE 180TH ST	TUG
North Coastal	Monticello	Hamilton	TUG 437462945 11TH ST SE	TUG
North Coastal	Monticello	Taylor	TUG 446034419 Bay Dr	TUG
South Central	Buena Vista	Orange	TUG 442314118 PARK AVE	TUG
North Coastal	Monticello	Wakulla	TUG 446034948 Woodville Hwy	TUG
North Coastal	Monticello	Taylor	TUG 437643670 N. Helen St	TUG
South Coastal	Walsingham	Pinellas	TUG 444120484 67TH AVENUE	TUG
South Central	Apopka	Orange	TUG 445664480 ROUND LAKE RD	TUG
South Central	Lake Wales	Polk	TUG 443590177 Edward Ave	TUG
North Coastal	Monticello	Taylor	TUG 437643278 N. Allen St	TUG
North Coastal	Inverness	Hernando	TUG 446550431 RAILROAD PLACE	TUG
North Central	JAMESTOWN	ORANGE	TUG 444231047 Chuluota Rd	TUG
South Coastal	Zephyrhills	Pasco	TUG 444253097 RYALS RD	TUG
North Central	Jamestown	Seminole/Orange	Self- Optimizing Grid Team 401	SOG
North Central	Jamestown	Seminole/Orange	Self- Optimizing Grid Team 411	SOG
North Central	Deland	Volusia	Self- Optimizing Grid Team 424	SOG
South Coastal	Clearwater	Pinellas	Self- Optimizing Grid Team 514	SOG
South Central	Winter Garden	Orange	Self- Optimizing Grid Team 426	SOG
South Central	Lake Wales	Polk	Self- Optimizing Grid Team 402	SOG
North Central	Deland	Volusia	Self- Optimizing Grid Team 403	SOG
North Coastal	Monticello	Franklin/Wakulla	Self- Optimizing Grid Team 505	SOG
North Central	Apopka	Orange	Self- Optimizing Grid Team 412	SOG
North Central	Longwood	Seminole	Self- Optimizing Grid Team 406	SOG
South Central	Lake Wales	Polk	Self- Optimizing Grid Team 413	SOG
South Central	Highlands	Highlands	Self- Optimizing Grid Team 408	SOG
South Coastal	St Petersburg	Pinellas	Self- Optimizing Grid Team 521	SOG
North Central	Jamestown	Orange	Self- Optimizing Grid Team 407	SOG
North Central	Jamestown	Orange	Self- Optimizing Grid Team 434	SOG

North Coastal	Ocala	Marion	Self- Optimizing Grid Team 527	SOG
South Central	Buena Vista	Polk/Osceola	Self- Optimizing Grid Team 427	SOG
North Central	Deland	Volusia	W902- Pierson-Seville Grid Strengthening Project	Deteriorated Conductor
North Coastal	Ocala	Marion	A202- Zuber- Country Rd 326 Grid Strengthening Project	Deteriorated Conductor
South Coastal	Clearwater	Pinellas	C104- Dunedin High and Highlander park Grid Strengtening Project	Deteriorated Conductor
South Central	SE Orlando	Orange	W392- Seminole Drive & Nela Ave Grid Strengtening Project	Deteriorated Conductor
South Central	Winter Garden	Orange	M342 Meadowbrook Ave	Deteriorated Conductor
North Central	Deland	Volusia	W4564 El Dorado Dr	Deteriorated Conductor
North Central	Apopka	Lake	M1517 S Fish Camp Rd	Deteriorated Conductor
North Central	Apopka	Orange	M707 W Highland Ave	Deteriorated Conductor
South Central	Buena Vista	Osceola	K881 North Goodman Rd	Deteriorated Conductor
South Central	Lake Wales	Polk	K8 Horseshoe Creek Rd	Deteriorated Conductor
North Central	Apopka	Orange	M0554 Ustler Rd	Deteriorated Conductor
South Central	Lake Wales	Polk	K3245 Water Tank Rd	Deteriorated Conductor
North Central	Deland	Volusia	W1703 S Blue Lake Ave	Deteriorated Conductor
North Central	Jamestown	Orange	W0250 Murdock Blvd	Deteriorated Conductor
North Central	Deland	Volusia	W0382 S Stone St	Deteriorated Conductor
North Central	Apopka	Orange	M417 Pine St	Deteriorated Conductor
North Coastal	Ocala	Marion	A51 134th Ave Micanopy	Deteriorated Conductor
North Central	Deland	Volusia	W4561 S Leavitt Ave	Deteriorated Conductor
North Central	Deland	Volusia	W4556 Dogwood Ave	Deteriorated Conductor
North Central	Apopka	Orange	M723 E Cleveland St	Deteriorated Conductor
North Central	Deland	Volusia	W1109 N Amelia Ave	Deteriorated Conductor
North Central	Deland	Volusia	W1110 S Virginia Ave	Deteriorated Conductor
North Central	Apopka	Orange	M402 Grace St	Deteriorated Conductor
North Central	Apopka	Orange	M33 Zellwood M33 Duda Rd	Deteriorated Conductor
South Coastal	Seven Springs	Pinellas	C303 N Spring Blvd & Pampas Ave	Deteriorated Conductor
North Central	Apopka	Lake	M1518 Harbor Shores	Deteriorated Conductor
North Central	Apopka	Orange	M400- West Lockhart Transformer Strengtening Project	Transformer Retrofit
South Central	Buena Vista	Orange	K925- Sand Lake I-Drive Transformer Strengthening Project	Transformer Retrofit
South Central	Highlands	Polk	K3205- North Fort Meade Transformer Strengtening Project	Transformer Retrofit
North Central	Apopka	Lake	M580 - Tavares East Transformer Strengthening Project	Transformer Retrofit
North Central	Apopka	Seminole	M1709 - Douglas Ave Transformer Strengthening Project	Transformer Retrofit
North Central	Apopka	Lake	M1054 - Eustis South Transformer Strengthening Project	Transformer Retrofit
North Central	Apopka	Orange	M33 - Zellwood Transformer Strengthening Project	Transformer Retrofit
North Central	Apopka	Seminole	M476 - Piedmont Transformer Strengthening Project	Transformer Retrofit
South Central	Buena Vista	Polk	K425 - Westridge Transformer Strengthening Project	Transformer Retrofit
South Central	SE Orlando	Orange	W0494 - Central Park Transformer Strengthening Project	Transformer Retrofit
South Central	SE Orlando	Osceola	W0629 - Holopaw Transformer Strengthening Project	Transformer Retrofit
South Central	SE Orlando	Osceola	W0630 - Holopaw Transformer Strengthening Project	Transformer Retrofit
South Central	SE Orlando	Orange	W0500 - Central Park Transformer Strengthening Project	Transformer Retrofit
South Central	SE Orlando	Orange	K1024 - Taft Transformer Strenthening Project	Transformer Retrofit
South Central	SE Orlando	Orange	K1025 - Taft Transformer Strengthening Project	Transformer Retrofit
South Central	SE Orlando	Osceola	W0105 - Canoe Creek Transformer Strengthening Project	Transformer Retrofit
North Central	Longwood	Orange	M81 - Transformer Strengthening Project	Transformer Retrofit
South Central	Highlands	Highlands	K1684 - Dinner Lake Transformer Strengthening Project	Transformer Retrofit
South Central	Highlands	Polk	K171 - Fort Meade Transformer Strengthening Project	Transformer Retrofit
North Coastal	Inverness	Citrus	A271 - Homosassa Transformer Strengtheing Project	Transformer Retrofit
North Coastal	Inverness	Marion	A112 - Ross Prairie Transformer Strengthening Project	Transformer Retrofit
South Central	Buena Vista	Orange	K1411 - Four Corners Transformer Strengthening Project	Transformer Retrofit
South Central	Lake Wales	Osceola	K1614 - Cabbage Island Transformer Strengthening Project	Transformer Retrofit
South Central	Lake Wales	Polk	K1196 - Babson Park Transformer Strengthening Project	Transformer Retrofit
South Central	Lake Wales	Polk	K1195 - Babson Park Transformer Strenghtening Project	Transformer Retrofit
South Central	Lake Wales	Polk	K19 - Haines City Transfomer Strengthening Project	Transformer Retrofit
North Central	Deland	Volusia	W1107 - Deland East Transformer Strengthening Project	Transformer Retrofit
North Central	Longwood	Seminole	M662 - Spring Lake Transformer Strengthening Project	Transformer Retrofit
North Central	Longwood	Seminole	M145 - Longwood Transformer Strengthening Project	Transformer Retrofit
North Central	Longwood	Seminole	M659 - Myrtle Lake Transformer Strengthening Project	Transformer Retrofit
North Central	Longwood	Orange	M1137 - Eatonville Transformer Strengthening Project	Transformer Retrofit
North Coastal	Monticello	Gulf	N201 - Port St.Joe Ind. Transformer Strengthening Project	Transformer Retrofit
North Coastal	Monticello	Gulf	N55 - Port St. Joe Transformer Strengthening Project	Transformer Retrofit
North Coastal	Monticello	Alachua	A144 - Alachua Transformer Strengthening Project	Transformer Retrofit
North Coastal	Monticello	Taylor	N7 - Perry Transformer Strengthening Project	Transformer Retrofit
North Coastal	Monticello	Taylor	N14- Perry Northwest Transformer Strengthening Project	Transformer Retrofit
North Coastal	Monticello	Taylor	N8 - Perry Transformer Strengthening Project	Transformer Retrofit
North Coastal	Monticello	Suwannee	A192 - Luraville Transformer Strengthening Project	Transformer Retrofit
North Coastal	Monticello	Columbia	A20 - Fort White Transformer Strengthening Project	Transformer Retrofit
North Coastal	Monticello	Jefferson	N67 - Monticello Transformer Strengthening Project	Transformer Retrofit
North Coastal	Monticello	Jefferson	N66 - Monticello Transformer Strengthening Project	Transformer Retrofit
North Coastal	Monticello	Alachua	A186 - GE Alachua Transformer Strengthening Project	Transformer Retrofit
North Coastal	Monticello	Jefferson	N69 - Monticello Transformer Strengthening Project	Transformer Retrofit
North Coastal	Ocala	Marion	A128 - Silver Springs Shores Transformer Strengthening Project	Transformer Retrofit
South Coastal	St Petersburg	Pinellas	X265 - Central Plaza Transformer Strengthening Project	Transformer Retrofit
South Coastal	St. Petersburg	Pinellas	X282 - Northeast Transformer Strengthening Project	Transformer Retrofit
South Coastal	Walsingham	Pinellas	J114 - Starkey Transformer Strengthening Project	Transformer Retrofit
South Coastal	Walsingham	Pinellas	X123 - Gateway Transformer Strengthening Project	Transformer Retrofit
South Central	Winter Garden	Orange	M339 - Clarcona Transformer Strengthening Project	Transformer Retrofit
South Central	Buena Vista	Orange	Live front to Deadfron+C60:C84t Switchgear Replacement- 6418272	Switchgear Replacement
South Central	Buena Vista	Orange	Live front to Deadfront Switchgear Replacement- 8003405	Switchgear Replacement
South Central	Buena Vista	Orange	Live front to Deadfront Switchgear Replacement- 8003486 (K4051/K4050)	Switchgear Replacement
South Central	Buena Vista	Osceola	Live front to Deadfront Switchgear Replacement 8012875	Switchgear Replacement
South Central	Buena Vista	Osceola	Live front to Deadfront Switchgear Replacement 8012876	Switchgear Replacement
South Central	Buena Vista	Orange	Live front to Deadfront Switchgear Replacement 8012911	Switchgear Replacement
South Central	Buena Vista	Orange	Live front to Deadfront Switchgear Replacement 7837709	Switchgear Replacement
South Central	Buena Vista	Orange	Live front to Deadfront Switchgear Replacement 7989918	Switchgear Replacement

South Central	Buena Vista	Orange	Live front to Deadfront Switchgear Replacement 7837708	Switchgear Replacement
South Central	SEO	Orange	Live front to Deadfront Switchgear Replacement W95249	Switchgear Replacement
South Coastal	Clearwater	Pinellas	Live front to Deadfront Switchgear Replacement 6346731	Switchgear Replacement
South Coastal	Clearwater	Pinellas	Live front to Deadfront Switchgear Replacement 7823366	Switchgear Replacement
South Coastal	Seven Springs	Pasco	Live front to Deadfront Switchgear Replacement 6524810	Switchgear Replacement
North Coastal	Inverness	Citrus	Live front to Deadfront Switchgear Replacement 8006311	Switchgear Replacement
North Coastal	Inverness	Marion	Live front to Deadfront Switchgear Replacement 8012466	Switchgear Replacement
North Coastal	Inverness	Citrus	Live front to Deadfront Switchgear Replacement 6524812	Switchgear Replacement
North Coastal	Inverness	Citrus	Live front to Deadfront Switchgear Replacement 6164434	Switchgear Replacement
North Coastal	Inverness	Citrus	Live front to Deadfront Switchgear Replacement 8006321	Switchgear Replacement
North Coastal	Ocala	Sumter	Live front to Deadfront Switchgear Replacement 8012605	Switchgear Replacement
North Central	Apopka	Orange	Live front to Deadfront Switchgear Replacement 6709265	Switchgear Replacement
North Central	Apopka	Orange	Live front to Deadfront Switchgear Replacement 6487590	Switchgear Replacement
North Central	Jamestown	Orange	Live front to Deadfront Switchgear Replacement 8012155	Switchgear Replacement
North Central	Jamestown	Orange	Live front to Deadfront Switchgear Replacement 8012147	Switchgear Replacement
North Central	Jamestown	Orange	Live front to Deadfront Switchgear Replacement 8012153	Switchgear Replacement
North Central	Jamestown	Orange	Live front to Deadfront Switchgear Replacement 6858455	Switchgear Replacement
North Central	Jamestown	Orange	Live front to Deadfront Switchgear Replacement 6096748	Switchgear Replacement
North Central	Jamestown	Orange	Live front to Deadfront Switchgear Replacement 6096738	Switchgear Replacement
North Central	Jamestown	Orange	Live front to Deadfront Switchgear Replacement 8012164	Switchgear Replacement
North Central	Jamestown	Orange	Live front to Deadfront Switchgear Replacement 6096737	Switchgear Replacement
North Central	Jamestown	Orange	Live front to Deadfront Switchgear Replacement 6173451	Switchgear Replacement
North Central	Jamestown	Orange	Live front to Deadfront Switchgear Replacement 8011899	Switchgear Replacement
South Central	Winter Garden	Orange	Live front to Deadfront Switchgear Replacement 8012720	Switchgear Replacement
South Central	Winter Garden	Orange	Live front to Deadfront Switchgear Replacement 8012721	Switchgear Replacement
South Central	Winter Garden	Orange	Live front to Deadfront Switchgear Replacement 8012753	Switchgear Replacement
North Coastal	Ocala	Lake	Live front to Deadfront Switchgear Replacement 8012609	Switchgear Replacement
North Central	Jamestown	Orange	Live front to Deadfront Switchgear Replacement 6221394	Switchgear Replacement
South Central	Winter Garden	Orange	Live front to Deadfront Switchgear Replacement 8012920	Switchgear Replacement

POST-STORM DATA COLLECTION AND FORENSIC ANALYSIS (*Initiative 6*)

a) **Has a forensics team been established?**

Distribution

Yes.

Transmission

Depending on the failure and forensics needed and according to Attachment T - DEF-Storm Forensic Analysis Specification, a team is established to ensure the forensics analysis is completed.

b) **Have forensics measurements been established? If yes, please describe/provide.**

Distribution

Yes. During the field observations, Forensic Assessors collect various information regarding poles damaged during storm events:

- Data points typically collected during the initial approach to the pole would include: pole type, number of conductors, joint-use status, number of transformers and other distribution equipment attached, etc.*
- Data points typically collected during the pole detail review would include: birth date, pole class, pole height, etc.*
- Data points typically collected during the site review would include a free form rendering of the site as well as qualitative data about damaged pole structures (e.g. whether the pole is leaning, broken, location of break, etc.).*

Transmission

Yes, according to Attachment T, forensics measurements are established.

c) **Has a forensics database format been established?**

Distribution

Yes, in collaboration with the University of Florida's Public Utility Research Center (PURC), DEF and the other Florida investor owned utilities developed a common format to collect and track data related to damage discovered during a forensics investigation. This ensures we are collecting compatible data to allow analysis of performance and refinement of the inputs to OH to UG Cost/Benefit model.

Transmission

DEF Transmission uses a shared drive to store all Transmission forensics analyses; in addition, transmission failed structures are tracked per-event utilizing spreadsheets to manage the forensics data described in Attachment T.

d) **Describe/provide GIS and forensics data tracking integration.**

Distribution

Pole location information is manually collected during forensic inspections in the field. Data is then available for analysis using GIS applications.

DEF has re-assessed statistical pods in DEF's GIS system to ensure their accuracy and statistical validity as a sample of the Duke Energy Florida service territory. The statistical pods are a post-storm sample used to quickly forecast the level of damage sustained by DEF's facilities following a major storm or hurricane. The damage assessment that results from these statistical samples allows more accurate targeting of the need and location for forensics teams.

Transmission

The forensic data that is collected is identified and cataloged by the structure number or GPS coordinate if the structure number is not available. The failure data can then be correlated with the data contained in the MapInfo GIS system. The maintenance history of the poles/structures will be populated in the GIS system.

- e) **Describe/provide forensics and restoration process integration. (Established and documented processes to capture forensics data during the restoration process.)**

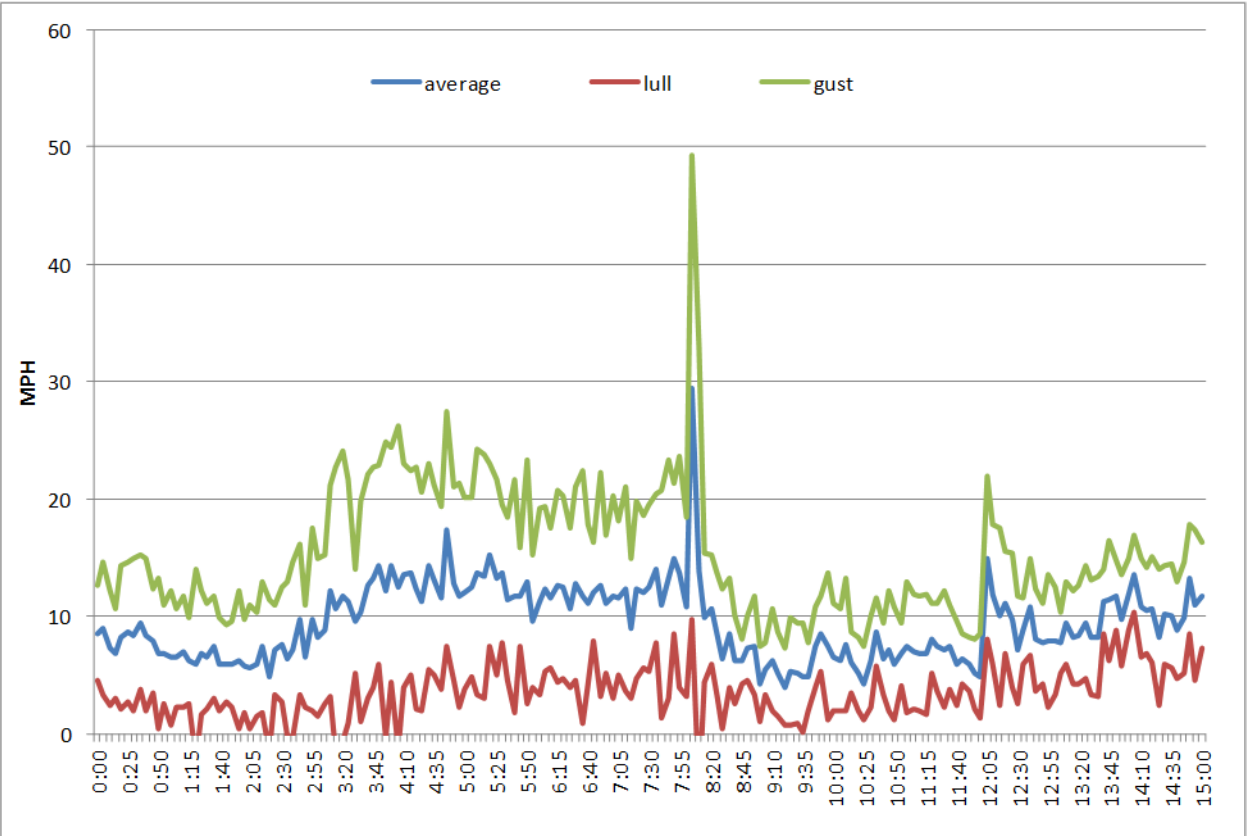
See Attachment T - "Damage Assessment" – GDLP-EMG-DOS-00008- Distribution's damage assessment process and "Transmission Storm Forensic Analysis Specification".

- f) **Describe/provide any forensics data sampling methodology.**

Distribution

Forensic assessors are mobilized to areas predicted to have the highest sustained wind speeds within the service territory to identify pole failure modes in a manner that will minimize interference with the restoration process.

As a result of the installation of weather stations across Florida (as part of the collaborative research project done with PURC and the other Florida electric utilities), DEF is now able to correlate, at a high level, experienced outages with nearby wind speeds. The graph below shows the registered wind speeds (mph) at the Land O Lakes substation weather station as severe weather caused more than 500 outages on April 5, 2011. This type of information is augmented with on-site forensics data following a major storm or hurricane.



Transmission

See Attachment T.

- g) **Describe/provide forensics reporting format used to report forensics results to the Company and the Commission.**

See Attachment T - “Damage Assessment” – GDLP-EMG-DOS-00008- Distribution’s damage assessment process and “Transmission Storm Forensic Analysis Specification”.

OVERHEAD/UNDERGROUND RELIABILITY (OH/UG) (INITIATIVE 7)

- a. Describe the five-year patterns/trends in reliability performance of underground systems vs. overhead systems.** See separate spreadsheet attachment.

See Attachment U - "Comparison of Historical Trends-Overhead vs. Underground"

- b. Describe Company efforts to separately track the reliability of overhead and underground systems.**

Following is a description of the process that will be used to separately track the reliability of overhead and underground systems:

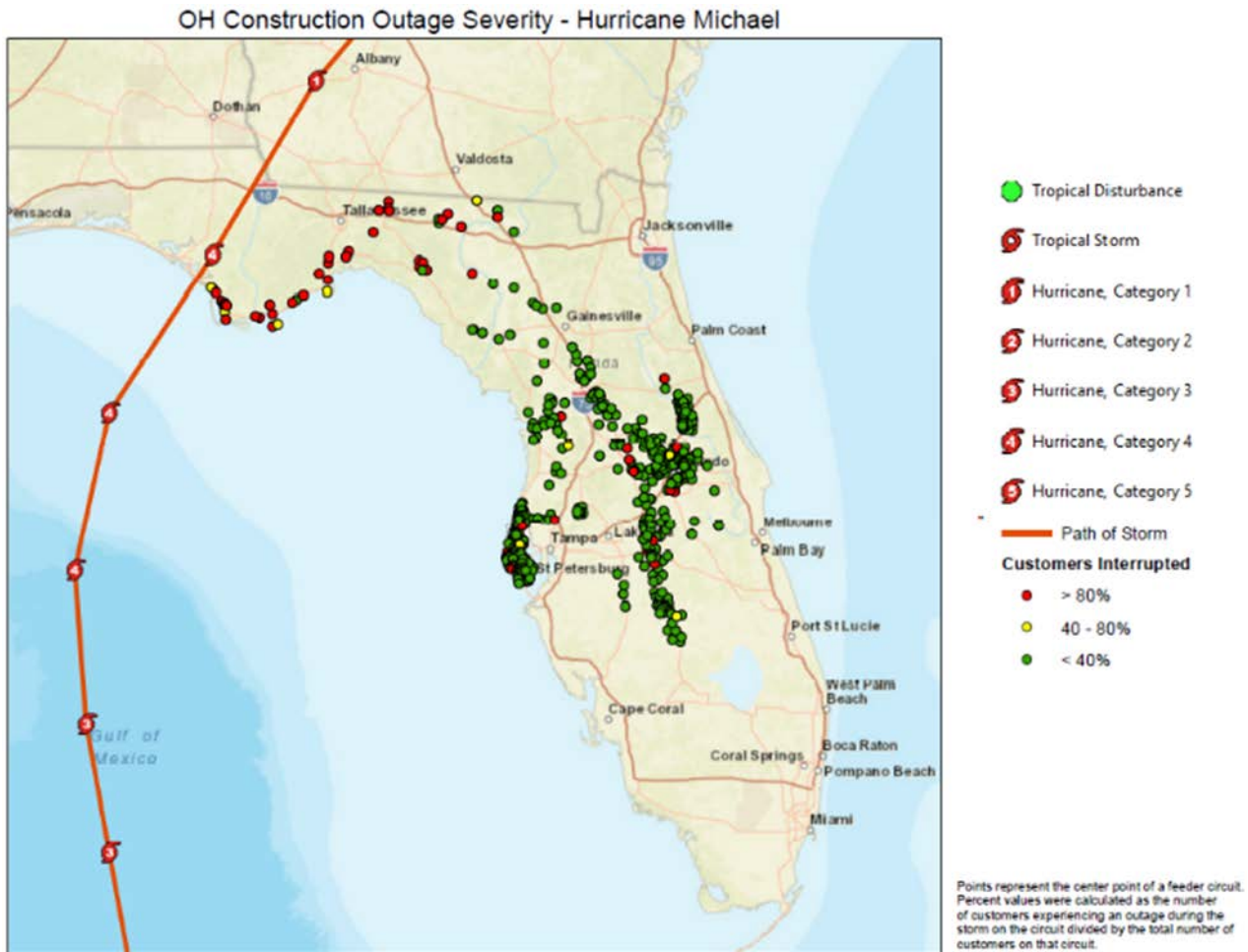
DEF will collect information to determine the percentage of storm caused outages on overhead systems and underground systems. Some assumptions are required when assessing the performance of overhead systems versus underground systems. For example, underground systems are typically protected by overhead fuses. DEF will provide for these factors in its analysis.

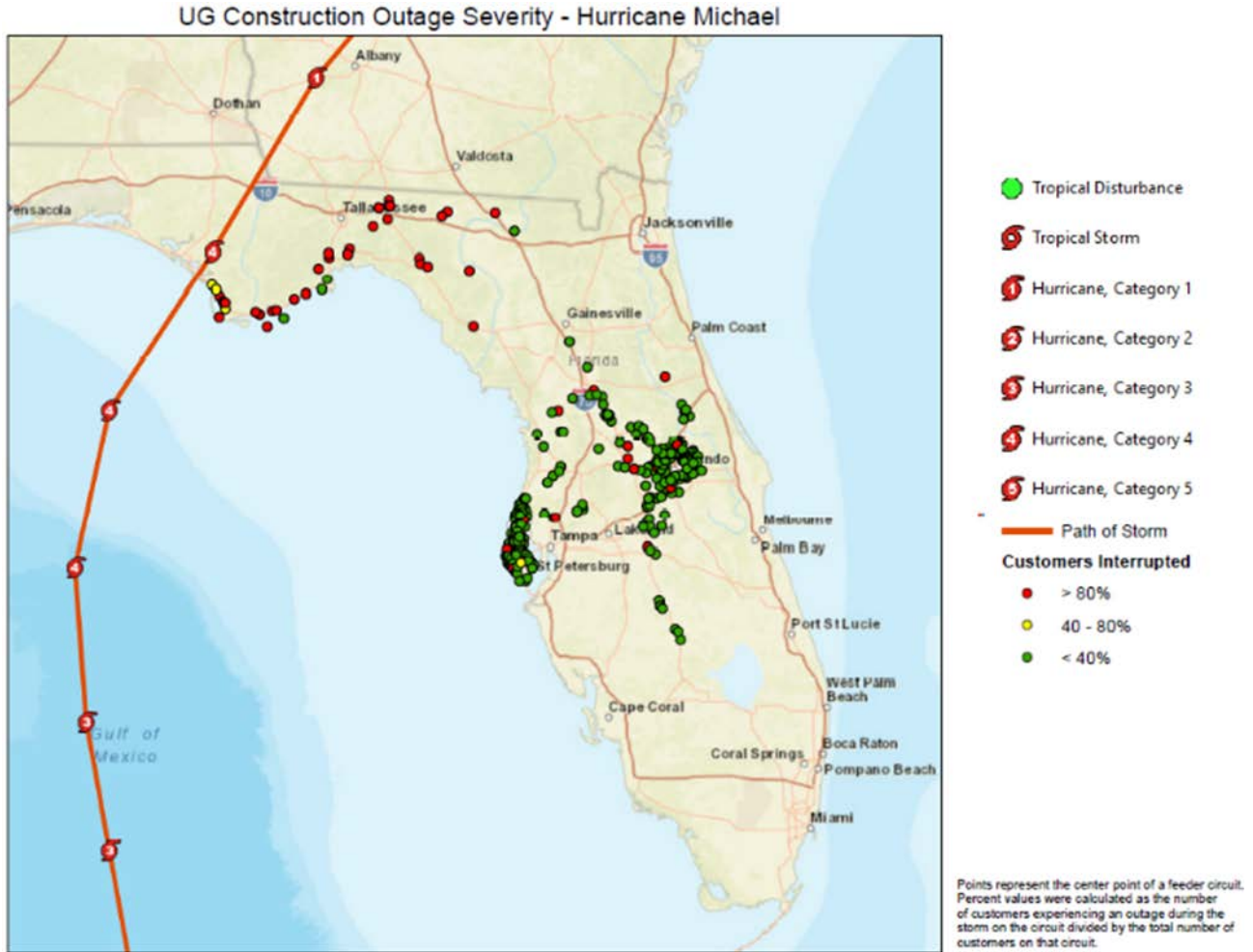
DEF has an internal hierarchy in its Outage Management System (OMS) that models how all of its facilities are connected to each other. This information provides the connection to the feeder breaker down to the individual transformer. DEF's Customer Service System (CSS) captures which customer is tied to what individual transformer. DEF's Geographical Information System (GIS) provides several sets of data and information points regarding DEF's assets. DEF uses these systems to help analyze the performance of the following types of overhead and underground assets:

- *Breakers*
- *Electronic Reclosers*
- *Fuses*
- *Hydraulic Reclosers*
- *Interrupters*
- *Motor Operated Switches*
- *OH Conductors*
- *OH Transformers*
- *Primary Meters*
- *Switch Gear Fuses*
- *Sectionalizers*
- *Services*
- *Switches*
- *Terminal Pole Fuses*
- *Under Ground Conductors*
- *Under Ground Transformers*

As part of this process, the location of each feeder circuit point is determined by approximating the geographic midpoint of each circuit. Outages experienced as a result of a named storm will be extracted from system data. The outages will then be grouped by feeder circuit ID and by outage type, where outage type is either overhead or underground. The number of customers interrupted by an overhead device will then be summed by feeder circuit ID and the number of customers interrupted by an underground device will be summed by feeder circuit ID. A single feeder circuit may have overhead and underground outages, so approximations will be made in those circumstances.

Once this information is collected, the percentage of customers interrupted will be calculated by dividing the sum of customers interrupted per feeder circuit by the total customers served for that feeder circuit. This process is applied as the sum of customers interrupted by all overhead devices on a feeder circuit divided by the number of customers served by the feeder circuit and the sum of customers interrupted by all underground devices on a feeder circuit divided by the number of customers served by the feeder circuit. As a result of this process, DEF will produce graphic representations of performance such as those depicted below for hurricane Michael:





DEF will also collect available performance information as a part of the storm restoration process via servicemen in the field, such as:

- Restore time;*
- Cause code;*
- Observations and comments;*
- Failed device name;*
- Failed device size;*
- Failed device type;*
- Failed device phase; and*
- Failed device location.*

c. Describe the process used by your company to identify and select the actions to promote underground distribution systems.

DEF notes that it does not necessarily promote underground distribution systems in all instances. Rather, DEF's programs are designed to identify areas where an underground distribution system would be effective both from an operational and cost/benefit perspective, and to help customers considering underground projects to receive the information that they need to make a well-thought decision.

In 2007, DEF created a project management organization dedicated to streamlining the engineering and construction of all infrastructure projects including underground conversions.

In 2018, DEF installed 196 circuit miles of new underground cable. Overall, the DEF distribution system consists of 44.34% primary underground circuit miles (14,337 circuit miles).

d. Provide Overhead/Underground metrics (miles, # of customers, CMI, CI, MAIFe, CEMI5 and L-Bar for the Calendar Year).

See Attachment V- "Overhead/Underground Metrics"

See Separate Spreadsheet with data listed (a) through (j).

(k) Overhead equipment of performance analysis by type per system. (wood pole vs. concrete pole, etc.) will not be available:

COORDINATION WITH LOCAL GOVERNMENTS (*Initiative 8*)

Update on Duke Energy Florida's (DEF) local government storm preparation, storm hardening, and storm response coordination activities:

This part of DEF's storm planning and response program addresses increased coordination with local governments to enhance DEF's ability to prepare for and respond to storms and other severe weather events. DEF's goal is to provide excellent customer service through a collaborative partnership with local governments before, during, and after emergencies through year-round dialogue and planning, strong relationships, the provision of resources, and communication and feedback mechanisms.

Specifically, DEF focuses on the following in implementing DEF's storm planning and response program in conjunction with local governments:

- Identify opportunities throughout the year to improve preparedness on both the part of the utility and the public taking advantage of government's local knowledge and existing organization.*
- Develop enhanced organization and planning to improve readiness.*
- Educate the public on proper storm preparation and restoration actions.*
- Provide local governments with the support needed to facilitate the coordination of outage restoration in a safe and efficient manner.*
- Provide local governments with ongoing information and updates in advance of, during and after storm events to assist them with their local storm preparation and restoration efforts including informing the public.*

DEF's storm planning and response program is operational twelve months out of the year and response activities can be implemented at any time. In order to meet the requirements of FPSC Order No. PSC-06-0351-PAA-EI, DEF has established an internal team focused on local governmental coordination activities. These activities include dedicated resources, training, continuous coordination with government, storm preparation and restoration, and an Emergency Operation Center (EOC) program. DEF provides local governments with resource and restoration information before, during and after storm events to assist with their local emergency response. Currently, there are approximately ninety resources assigned to coordination with local government as part of an emergency planning and response program. Also, approximately seventy employees are assigned full-time, year-round, to coordinate with local government on issues such as emergency planning, vegetation management, undergrounding and service related issues and governmental coordination. In addition to DEF's resources in Florida, DEF also has access to resources throughout the Duke Energy multi-state organization, which provide important extra resources. All of Duke Energy's jurisdictions are prepared to provide assistance.

Emergency Planning and Storm Coordination – DEF’s team works with counties and municipalities year-round and during major storm events. Prior to storm season, DEF holds meetings with communities to discuss emergency planning preparations and coordination, participates in county drills and training exercises, and holds community education workshops and events.

Annually, DEF conducts an internal system-wide storm drill in which all members of the team participate. This supports initiatives to coordinate with local government including emergency management organizations throughout the year. Storm preparedness training prior to storm season simulates the response to a real storm including pre-storm preparations activities during a major storm event and post-storm response. Staffing scenarios are created to simulate different storm impacts and staffing assignments to support each impact scenario. During this exercise, the county EOCs are engaged as part of the simulation. Additionally, the DEF State EOC Representatives team works with the state agencies to coordinate DEF’s participation in the annual state storm drill.

DEF has enhanced the capability to produce detailed electronic outage information which is provided to county EOCs specifically for that county. The information is available in multiple formats, including formats that may be imported into county GIS systems. The information includes detailed outage data per each square mile within the county and is produced periodically during each day of a significant event.

DEF has a dedicated storm web page with an interactive map that is available to the public, including the media and local governments. The interactive map provides access to the latest outage information twenty-four hours a day, seven days a week. These maps provide county-specific estimates for power restoration when available, and the ability to search by address. Also, DEF has developed a system to report outages online via computer or other mobile devices. This online reporting tool gives DEF’s customers another way to communicate with DEF, helping ensure any disruptions in service are recognized immediately and that power is restored as quickly and safely as possible.

Vegetation Management – It has become essential to implement programs designed to improve coordination with communities regarding vegetation management. DEF is responsible for maintaining approximately 46,000 miles of power lines in Florida and proactively manages trees and other vegetation to help ensure safe, reliable service for approximately 1.8 million customers across our 20,000 square-mile service area. Maintaining trees and vegetation along distribution and transmission right of ways help reduce outages on a day-to-day basis as well as during storm events and enhances safety for customers, the public, and DEF’s employees and contractors. DEF manages tree placement under transmission and distribution lines through the “Know Where You Grow” outreach program. DEF maintains a rigorous inspection process that identifies vegetation encroachments and ensures vegetation management activities follow required pruning and clearance specifications. To enhance communication with DEF’s communities regarding specific tree trimming projects, DEF meets with municipalities prior to implementation of significant projects in order to inform them of the general areas that are expected to be impacted, note concerns, and answer questions. DEF also conducts communication and outreach to customers along the impacted areas for significant activities to inform them of the project, as well as explain the need for vegetation management. DEF has completed the development of a community vegetation

management education program, designed to ensure that DEF customers will have received some form of vegetation management education through community outreach, events, website information, advertising and other communication outlets. From January to April 2018, DEF's vegetation management team sent over 50,000 emails to customers in Pinellas, Polk and Seminole counties explaining the program and the benefits of planting trees in order provide maximum growth without hindering power lines.

In 2018, DEF was designated a "Tree Line USA Utility." This designation is given by the National Arbor Day Foundation, in cooperation with the National Association of State Foresters. It recognizes public and private utilities across the nation that demonstrate practices that protect and enhance community forests while managing the need for reliable electric power. DEF has received the Tree Line USA designation for thirteen consecutive years. In partnership with the Arbor Day Foundation's Energy-Saving Trees program, in 2018, DEF provided 2,400 trees in 1-gallon pots to customers – for free – to honor Florida Arbor Day. The Arbor Day Foundation's Energy-Saving Trees and Tree Line USA programs demonstrate how trees and utilities can co-exist for the benefit of communities and citizens by highlighting best management practices in public and private utility arboriculture.

Undergrounding – The impact of hurricanes from 2016-2018 has renewed local governments' interest in burying converting overhead power lines to underground facilities. In an effort to work with communities to address this continued interest in undergrounding their utilities, DEF is enhancing its programs in this area and has seen a marked increase in interest in the programs. DEF works with communities to inform them of available undergrounding options and to be a part of their planning processes. This assists them in several ways, including better fiscal planning, coordination with other utilities, and improved communications with affected residents. DEF also coordinates with local governments on subaqueous cable projects to DEF's beach and island communities to improve reliability and storm restoration efforts.

Other Construction Projects – In addition to undergrounding conversion projects, there are planned transmission and distribution enhancement projects that are expected to result in improvements to system reliability during storm events. DEF works extensively with local governments and communities to coordinate such projects.

Educational Outreach - DEF continues to hold live line demonstrations, which include critical information for first responders and emergency management personnel. DEF's team of experts recreate live-voltage scenarios such as downed power lines, trees, animals, and/or ladders on power lines, vehicle wrecks involving power lines, and digging into underground facilities incidents. DEF also provides a safety presentation at the session, as well as sharing DEF's storm coordination and planning efforts in a separate presentation. DEF shares this information with city, county and emergency personnel to assist them in planning and safety instruction. Additionally, these live line demonstrations were conducted in conjunction with select county high school and grade schools.

DEF continues its educational efforts in communicating with government leaders and customers by creating storm preparedness publications for use by community relations personnel at public events, participating in storm discussions on the radio and in television storm discussion broadcasts and advertising in newspaper inserts and storm preparedness publications. Additionally, DEF has greatly enhanced storm preparedness communications and information via social media outlets.

EOC Road Clearing Program - *Immediately following a major storm such as a hurricane, accessibility for First Responders is a crucial component to public safety. In 2018, DEF enacted the road clearing program to provide dedicated resources to assist County EOC road clearing programs within DEF's service territories for the first 24 – 48 hours of storm restoration with road clearing and “make it safe” activities. DEF resources work with county road clearing crews and remove DEF facilities from across roads, allowing the county to safely clear the roads. DEF has dedicated crews for each service territory zone staged at county facilities or DEF operations centers. The benefits of this program include improved response time to county priorities, improve customer satisfaction by reducing customer outage times, reduced exposure to night time storm hazards, and increased DEF crew productivity during daylight hours.*

Hurricane Michael - *Hurricane Michael was a historic hurricane that caused widespread, devastating damage across northern Florida. Hurricane Michael made landfall October 10, 2018 as a Category 4 hurricane with maximum sustained winds of 156mph, making the hurricane just shy of a Category 5 designation. It was the most powerful Florida Panhandle storm and the fourth most powerful hurricane to strike the United States. Hurricane Michael's direct impact as a Category 4 hurricane created a range of damage from tropical storm impacts to complete devastation.*

Hurricane Michael took DEF from restoration to rebuild in some areas. During restoration, in DEF's service territory, more than 5,100 line and field workers replaced approximately 775 distribution poles, 130 transmission towers and 351 transformers. However, Hurricane Michael was the first hurricane to require a complete rebuild of three distribution feeders served by DEF. During the rebuild, DEF rebuilt 1,465 distribution poles, and 460 transformers. Duke Energy restored power to 75,000 customers during the event who were able to receive power within eight days.

DEF provided around the clock support for the State EOC and County EOC support for all counties in DEF's northern service territory. The EOCs were staffed with DEF EOC representatives during daytime operations and remotely after hours. DEF's EOC representatives, Government and Community Relations Managers and the DEF Operations Centers worked closely with EOCs in areas to enact the road clearing program in four counties with distribution field support to collaborate with county resources to clear the roads of DEF facilities. The road clearing process was a lesson learned from prior storms and ongoing collaboration with the counties. While the intent of the process is to provide resources to assist County EOC road clearing programs within DEF service territories for the first 24 – 48 hours of storm restoration, DEF provided road clearing resource support to the County EOCs well beyond the initial hour guidelines. DEF also worked in collaboration with the County EOCs to de-energize areas due to flooding, as well as the inspection process to re-energize facilities who could receive power.

As part of DEF's yearly planning process, DEF works with counties to identify and prioritize specific infrastructure within the counties. This prioritization of these critical accounts is factored into DEF's tactical restoration plan. DEF's County and State EOC representatives processed over 4,500 critical issues from the EOCs during the event.

In an effort to keep local governments and the public informed, during the event, DEF used the power of the media. Over 1.6 million outbound customer messages were sent over duration of event. Using DEF's social media sites, DEF had 24,000 views on DEF's dedicated webpage for Hurricane Michael. DEF conducted print and broadcast interviews providing preparation, storm status, and restoration updates as well as several national interviews with the Duke Energy Florida State President, who participated in daily round table calls facilitated by the Florida Governor. DEF also distributed eight news releases in both English and Spanish, which detailed the restoration progress by county. A separate team was established for the complete rebuild of the electric grid in Mexico Beach where high winds and storm surge eliminated miles of transmission and distribution lines. DEF and Mexico Beach worked in close coordination to rebuild the electric grid in two weeks.

To assist its communities, customers and neighbors devastated by Hurricane Irma, the Duke Energy Foundation announced a donation of \$1,000,000 to assist organizations and agencies that provide communities with response and recovery activities.

2018 Activities

The following activities are not an exhaustive list, but include examples of the activities associated with DEF's coordination activities with state and local governments for 2018:

- *Emergency Operation Center visits were performed in Alachua, Bay, Citrus, Columbia, Franklin, Gadsden, Gilchrist, Gulf, Hamilton, Hardee, Hernando, Highlands, Jefferson, Lafayette, Lake, Liberty, Leon, Levy, Madison, Marion, Orange, Osceola, Pasco, Pinellas, Polk, Seminole, Sumter, Suwannee, Taylor, Volusia and Wakulla counties. During those visits, DEF participated in EOC exercises to review storm procedures prior to storm season and to discuss the Make It Safe road clearing program. (April – August 2018)*
- *Duke Energy Florida Storm Drill Exercise – As part of DEF's ongoing effort to ensure that DEF employees can perform their storm roles and processes are validated, DEF prepares a week-long storm drill engaging various organizations across within the company, performing a review of existing storm plans and incorporates improvements from lessons learned processes following recent storm events and from identified organizational gaps discovered during structured storm drills and deployments. The purpose of a system level drill is to provide storm personnel an opportunity to evaluate, during a "realistic" storm scenario, their storm response concepts, plans and capabilities in response to a major hurricane. During the system level drill, EOC Representatives prepared mock storm scenarios and coordinated the event with the EOCs throughout the region. (April 2018)*
- *Florida Statewide Hurricane Exercise - Representatives throughout the DEF service territory participated in storm preparedness activities throughout this event. (May 2018)*

- *Executive EOC Visits – DEF Executive Leaders, Government and Community Relations Managers, and EOC representatives met with the EOC Directors and staff to discuss storm coordination for 2017 in Pinellas, Pasco, Orange, Seminole and Volusia counties. (May and August 2018)*

- *Additionally, a chart is provided for additional coordination activities with local government.*

<i>Entity</i>	<i>Date(s)</i>	<i>Topics</i>
<i>Sumter County</i>	<i>1/10/18</i>	<i>ESF8 Sumter Co "How Do We Restore Power" presentation</i>
<i>Sumter County</i>	<i>1/25/2018</i>	<i>Emergency Management Advisory Committee</i>
<i>City of Umatilla Chamber of Commerce</i>	<i>2/1/2018</i>	<i>Hurricane Preparedness and Response</i>
<i>City of Monticello</i>	<i>2/20/2018</i>	<i>Hurricane Preparedness and Response</i>
<i>City of Leesburg Chamber of Commerce</i>	<i>2/22/2018</i>	<i>Hurricane Preparedness and Response</i>
<i>Franklin County EOC</i>	<i>3/1/2018</i>	<i>Pre-season Annual EOC Visit</i>
<i>City of Clearwater Public Works Dept.</i>	<i>3/15/2018</i>	<i>Critical Infrastructure Discussion</i>
<i>City of St. Petersburg</i>	<i>3/20/18</i>	<i>Discussion on storm power quality, vegetation management, large account management and other community issues</i>
<i>Haines City</i>	<i>3/28/2018</i>	<i>Hurricane Preparedness and Response</i>
<i>Avon Park Chamber of Commerce</i>	<i>3/29/2018</i>	<i>Hurricane Preparedness and Response</i>
<i>City of St. Petersburg</i>	<i>4/2/2018</i>	<i>Disaster Recovery Post Storm</i>
<i>Hernando County EOC</i>	<i>4/17/2018</i>	<i>2018 Hurricane Tabletop Exercise</i>
<i>Hernando County EOC</i>	<i>4/18/2018</i>	<i>Hernando County EOC Drill Exercise</i>
<i>Osceola County EOC</i>	<i>4/27/2018</i>	<i>Lessons Learned from 2017 including future improvements to storm response.</i>
<i>Sumter EOC</i>	<i>4/27/2018</i>	<i>Sumter County EOC Storm Drill</i>
<i>Florida State EOC</i>	<i>4/30/2018</i>	<i>Florida State EOC Annual Drill</i>
<i>Lake County</i>	<i>4/30/2018</i>	<i>Lake County Local Mitigation Strategy Working Group Seminar. Duke Energy and Lake County stakeholders discussed how to improve the before, during and after of power restoration.</i>
<i>Lake County EOC</i>	<i>5/1/2018</i>	<i>Lake County Office of Emergency Management EOC Participation with Florida Division of Emergency Management to discuss WebEOC and resource management software.</i>
<i>Levy County EOC</i>	<i>5/1/2018</i>	<i>2018 Hurricane Season Kick Off Meeting</i>
<i>PSC</i>	<i>5/2/2018</i>	<i>PSC Hurricane Workshop</i>
<i>Lake County EOC</i>	<i>5/2/2018</i>	<i>Storm event lessons learned with other electric utilities and Lake county government.</i>
<i>Citrus County</i>	<i>5/3/2018</i>	<i>Citrus County Hurricane Exercise</i>
<i>Wakulla County EOC</i>	<i>5/7/2018</i>	<i>Wakulla EOC Planning Meeting to discuss Critical infrastructure lists</i>
<i>Taylor County EOC</i>	<i>5/8/2018</i>	<i>Taylor County Emergency Management Stakeholders Advisory Group</i>
<i>City of St. Petersburg</i>	<i>5/10/218</i>	<i>Hurricane Irma Review</i>
<i>City of St. Petersburg</i>	<i>5/12/2018</i>	<i>Hurricane Expo with St. Petersburg Fire & Rescue</i>

<i>Citrus County Sheriff's Office</i>	<i>5/12/2018</i>	<i>Annual Hurricane & All Hazards Expo held by Citrus County Sheriff's Office, Division of Emergency Operations, Emergency management.</i>
<i>Florida Division of Emergency Management, Florida Emergency Preparedness Association, Red Cross, NOAA</i>	<i>5/14/2018</i>	<i>I3 Exercise (Independent Infrastructure Incident - NSF PRAISys Project (National Science Foundation). DEF participated as a panelist and research contributor as part of emergency preparedness, 40 trainings, 50 workshops, and simulated disaster scenarios.</i>
<i>Clearwater Gas, Clearwater Police, Clearwater City Administrator, Clearwater Emergency Management</i>	<i>5/16/2018</i>	<i>Insight into the behind the scenes of a storm, creating company policies and restoring your business back to normalcy</i>
<i>Citrus County</i>	<i>5/16/2018</i>	<i>Citrus County First Responders Recognition Event – Duke Energy presented on the importance of first responders in storm response</i>
<i>Sumter County BOCC, Emergency Management Division</i>	<i>5/22/2018</i>	<i>Planning meeting with public works and utility providers on utility restoration and prioritization, including Critical infrastructure lists.</i>
<i>Seminole County EOC</i>	<i>5/25/2018</i>	<i>Annual EOC Visit</i>
<i>Orange County</i>	<i>5/31/2018</i>	<i>Panel discussion, storm preparedness and live line demonstration for community leaders and first responders</i>
<i>Marion EOC</i>	<i>5/31/2018</i>	<i>Marion County EOC Storm Drill</i>
<i>Hernando County EOC</i>	<i>5/31/2018</i>	<i>County Wide Hurricane Exercise to discuss Critical infrastructure lists.</i>
<i>Hernando County EOC</i>	<i>6/4/2018</i>	<i>Continued discussion from 5/31/2018 exercise</i>
<i>Air & Waste Management Conference</i>	<i>6/5/2018</i>	<i>Hurricane Preparedness, DEF response to an imminent storm and responding to the aftermath, storm hardening to minimize damage to generation and transmission/distribution.</i>
<i>Sumter EOC</i>	<i>6/5/2018</i>	<i>Critical Infrastructure discussion and training</i>
<i>Highlands County</i>	<i>6/8/2018</i>	<i>Highlands County Hurricane Expo storm preparedness presentation</i>
<i>St. Petersburg Fire and Rescue</i>	<i>6/9/2018</i>	<i>Hurricane Preparedness Expo – presented on Hurricane Preparedness and Response</i>
<i>Ocala/Marion County Chamber & Economic Partnership Breakfast</i>	<i>6/12/2018</i>	<i>Attended in collaboration with Sumter Electric Cooperative on “Storm Ready”.</i>
<i>Lake County and Florida Public Relations Association Lake Chapter</i>	<i>6/13/2018</i>	<i>Presentation "In the Eye of the Storm: How Duke Energy Communicates during Crisis"</i>
<i>The City of Winter Springs Public Works Director and the Senior Planner for Seminole County</i>	<i>6/14/2018</i>	<i>Addressed hurricane preparedness and improvements regarding power line easements.</i>
<i>Franklin County EOC</i>	<i>6/18/2018</i>	<i>EOC Visit</i>
<i>Lake County EOC</i>	<i>6/21/2018</i>	<i>Discussion on the increased number of shelters in Lake County and WebEOC</i>
<i>Florida Association of Counties</i>	<i>6/26/2018</i>	<i>Presented Hurricane Preparedness and Response to FAC</i>
<i>Sumter EOC</i>	<i>6/28/2018</i>	<i>Sumter County Hurricane Workshop</i>
<i>City of Deland</i>	<i>7/10/2018</i>	<i>Storm preparation meeting with City of Deland with government field supervisors and mid-level leadership for each organization.</i>
<i>Volusia County EOC</i>	<i>7/16/2018</i>	<i>Annual meeting with EOC Director. Discussed lessons learned from 2017.</i>
<i>Pasco County EOC</i>	<i>7/17/2018</i>	<i>Discussed EOC staffing, road clearing, vegetation management and the critical customer/restoration priorities with the Assistant Director of Emergency Management.</i>
<i>Marion County EOC</i>	<i>7/18/2018</i>	<i>EOC Visit</i>
<i>Citrus County EOC</i>	<i>7/18/2018</i>	<i>EOC Visit</i>

Bay Pines VA Healthcare System, American Red Cross, Seminole Fire, and the Veteran's Integrated Service Network Emergency Management team		Emergency Preparedness Fair to provide important resources to Veterans and employees to help them prepare for emergencies. Duke Energy presented on hurricane preparedness.
Levy County EOC	7/23/2018	EOC Visit
Pinellas County EOC	7/24/2018	Meeting with the new interim Director David Halstead. Topics of discussion: what will be different in 2018 that we have improved upon from last year, restoration times and expectations, D1/R1 process, restoration process and critical facilities lists, how Duke restores and how we take direction from the County on their priorities and that of the local cities, as well as road clearing successes and future.
Alachua County EOC	7/26/2018	EOC Visit
City of Fort White	7/26/2018	Hurricane Preparedness and Response
City of Deland	7/26/2018	Hurricane Preparedness and Response
Orange County EOC	8/2/2018	Annual EOC Visit
Marion County EOC	8/2/2018	EOC Visit
City of Deland: Public Works Director, Public Works Operations Manager, Street/Stormwater, Tree/Urban	8/2/2018	The purpose was to discuss Road Clearing, Lift Stations, Critical Customer lists, our Hurricane plan, lessons learned and how we have improved
Highlands County EOC	8/7/2018	Annual EOC Visit
Taylor County EOC	8/7/2018	Annual EOC Visit
Hernando County EOC	8/7/2018	EOC Visit
Sumter County EOC	8/8/2018	Teleconference with Sumter EOC
Orange County EOC	8/8/2018	Orange County's 2018 EOC COOP (Continuity of Operation Plan) Exercise to discuss sinkholes opening at the primary EOC location and the function of E-Team. (County's Incident Tracking System)
City of Tarpon Springs: Public Works Director, Streets & Stormwater Supervisor	8/10/2018	Met to discuss Duke Energy's 2018 Storm Response & Preparedness Planning. Reviewed the critical facilities/customer list, restoration priorities, DEF's priority ranking system, EOC staffing, WebEOC, and road clearing.
Gilchrist EOC	8/13/2018	Annual EOC Visit
City of Safety Harbor: Assistant City Manager, Public Works Director	8/16/2018	Met to discuss Duke Energy's 2018 Storm Response & Preparedness Planning. Reviewed the critical facilities/customer list, restoration priorities, deploying generators to support critical infrastructure, EOC staffing, Web EOC and road clearing.
Polk County EOC: Polk County EM Program Manager, Polk County EM Director, field rep for Congressman Darren Soto, 9th District.	8/16/2018	Meeting to review Duke Energy's Storm Plan and Response. Reviewed the Duke Energy Incident Command system and operations, the road clearing program and requirements, the planning and use of the critical facilities/customer list, and general discussion of the state requirements for ALF and nursing homes.
Polk County	8/16/2018	Live line demonstration and Hurricane Irma lessons learned presentation for first responders.
Highlands County EOC	8/20/2016	Discussion on critical infrastructure with Highlands county EOC.
City of Apopka Fire Department	8/21/2018	Updated facilities critical list, critical zones and intersections, potential flooding zones and Apopka's storm master plan.
City of Seminole	8/21/2018	Met with the Community Development Director to discuss the critical facilities/customer list and made updates, reviewed Duke Energy's priority ranking system, EOC staffing, WebEOC, road clearing, storm staging sites.

<i>City of St. Petersburg Emergency Management Program Advisory Group</i>	<i>8/21/2018</i>	<i>Meeting to discuss the community's emergency preparedness and resilience, provide feedback on the draft of the 2018-2020 Emergency Management Strategic Plan.</i>
<i>Highlands County EOC: Highlands County EM Manager</i>	<i>8/23/2018</i>	<i>Meeting to review Duke Energy Critical facility/customer list for county priorities, how the list is established and used for priority restoration by feeder at the Duke Energy storm rooms. Reviewed county facilities and shelters in the existing list, and added some facilities to the list.</i>
<i>Polk County EOC: Polk County EM Program Manager, Polk County EM Director</i>	<i>8/24/2018</i>	<i>Meeting to review Duke Energy Critical facility/customer list for county priorities, how the list is established and used for priority restoration by feeder at the Duke Energy storm rooms.</i>
<i>Seminole County EOC</i>	<i>8/28/2018</i>	<i>Discussion regarding tagging meters that have been approved to re-energize during both "Grey Sky Days" & "Blue Sky Days".</i>
<i>Hernando County EOC</i>	<i>8/30/2018</i>	<i>Focused on essential services and the customer including targeted undergrounding, Smart meters, hardening the grid, ETRs based on field review, EOC staffing, restoration priorities/critical facility/customer Lists, Citizen's Information Lin, First Responder Guidance, road clearing, public safety vs. customer restoration, GIS service territory maps.</i>
<i>Gulf County EOC</i>	<i>8/30/2018</i>	<i>Discussed critical facility/customer lists and restoration process</i>
<i>City of Clermont: Fire Marshal, Assistant Fire Chief, Director of Capital Planning & Projects, Public Works Director, Police Captain</i>	<i>8/31/2018</i>	<i>Lessons learned from Hurricane Irma, including technology issues for outage information, restoration estimates, what to tell their citizens, critical customer feeders and Duke's function at the EOC's. Shared the critical facility/customer for the city of Clermont.</i>
<i>City of Zephyrhills</i>	<i>9/14/2018</i>	<i>Reviewed Zephyrhills critical facility/customer list, restoration priorities, EOC staffing, road clearing, and vegetation management, including trim cycles and recent tree trimming in the Zephyrhills area.</i>
<i>Orange County EOC</i>	<i>9/26/2018</i>	<i>Threat Hazard Identification Risk Assignment and Stakeholder Preparedness Review at Orange county EOC. Duke attended as a representative for ESF 12.</i>
<i>Levy County EOC</i>	<i>10/2/2018</i>	<i>EOC visit</i>

2019 Activities

The following activities are currently planned activities associated with DEF's coordination activities with state and local governments for 2019:

State Activities:

- *Florida Division of Emergency Management's Severe Weather Awareness Week (January – 14-18, 2019)*
- *National Hurricane Conference (March 26-29, 2018)*
- *33rd Annual Governor's Hurricane Conference (May –12-18, 2019)*

Additional 2019 County/City Activities:

- *DEF representatives will meet with county representatives in each of DEF's counties throughout the service territory during the year as well as participate in pre-storm season planning activities such as mock drills at the County EOCs. These meetings and visits will also include updating the EOCs on DEF emergency response policies and DEF website demonstrations on how to access electronic outage information during storm events. Some examples are provided below.*
 - *DEF conducts ongoing communications with municipalities to provide information about DEF's emergency response planning, respond to inquiries, and to update county contact information for all EOCs.*
 - *DEF executives will meet with many of the county EOC directors and their staff to discuss DEF's storm response planning and enhancement of the coordination between the company and county emergency management.*
- *DEF is planning to continue to expand the number of live line demonstrations across the service territory. These events will take place from January – May and continue after the end of the hurricane season.*
- *DEF will meet with school board superintendents and their staff to discuss storm coordination, restoration prioritization, shelter locations and back-up generation availability.*
- *DEF will participate in many community hurricane and storm expos held by counties or federal or state agencies throughout DEF's service territory to inform the public and encourage appropriate storm preparation by residents and business.*

COLLABORATIVE RESEARCH (*Initiative 9*)

Project Planning Report: For each project identified by the Steering Committee, provide a report that includes the purpose, scope, objectives, research method, data inputs, expected costs and benefits, sources of funding, schedule, and findings to date.

Please see Attachment W - "PURC Report on Collaborative Research for Hurricane Hardening" dated February 2019.

Annual Progress Report: For each project previously identified by the Steering Committee for which ongoing research is being pursued but not completed, provide an annual report, including updates on all aspects of the Project Planning Report.

Please see Attachment W - "PURC Report on Collaborative Research for Hurricane Hardening" dated February 2019.

Project Completion Summary Report: For each concluded project identified by the Steering Committee, provide a report that includes an assessment of the success of the research project, as well as any proposed implementation plan for any results or findings for each utility. Describe the benefits expected or realized as a result of plan implementation on storm hardening for each utility.

Please see Attachment W - "PURC Report on Collaborative Research for Hurricane Hardening" dated February 2019.

Annual Report of the Collaborative Research Effort: Provide a report to include an overall assessment of the collaborative research program to date, as described in the Memorandum of Understanding (MOU) dated January 1, 2010, including its operational and financial viability and future planning of the organization. Identify any extension of the MOU contemplated or finalized by the Steering Committee.

Please see Attachment W - "PURC Report on Collaborative Research for Hurricane Hardening" dated February 2019.

Describe the projects promoted, costs incurred, and benefits achieved. A single joint filing can address all collaborative research. Utilities should also discuss any additional independent activities in which it is engaged, such as EPRI, private research, or through universities.

Please see Attachment W - "PURC Report on Collaborative Research for Hurricane Hardening dated February 2019. In addition to DEF's involvement with PURC, DEF is actively engaged as both participant and presenter in a variety of technical and professional organizations where hardening alternatives are reviewed and assessed. Examples include the Southeastern Electric Exchange (SEE), Edison Electric Institute (EEI), Institute of Electrical and Electronics Engineers (IEEE), Chartwell Hardening Teleconference, and Davies Consulting Asset Management Conference. DEF Standards engineers also assess new products on a continuous basis.

DISASTER PREPAREDNESS AND RECOVERY PLAN (*Initiative 10*)

Submit formal disaster preparedness plan annually by March 1st. Include disaster recovery training completed, pre-storm preparation and staging activities, post storm recovery plans, lessons learned, and plan modifications or changes.

Duke Energy has an established storm recovery plan that is reviewed and updated annually based on lessons learned from the previous storm season and organizational needs.

For Distribution - See Attachment X – “Distribution System Storm Operational Plan (DSSOP).

For Transmission – See Attachment Y – “Transmission Storm Plan”.

Duke Energy Florida-Transmission Storm Forensic Analysis Specification

Description of Services

The purpose of the forensic analysis services will be to collect and analyze damaged facilities and components after a storm event. The results of the analysis should provide correlation of the failed facilities to (1) storm intensity, (2) storm location, (3) facility condition and maintenance history, (4) facility design and vintage.

The forensic analysis requirements consist of four components:

- Post event data collection
- Forensic analysis of collected data
- Correlation of forensic analysis with storm data and GIS data
- Reporting of analysis

Criteria for forensics analysis shall include, but not be limited to, the following types of failures:

- Engineered steel structures
- Concrete structures
- Towers
- Dead-end structures
- 5 consecutive structures
- Multiple spans of OHG / OPGW
- Multiple spans of conductor

Contractor Qualifications

The forensic analysis contractor must be capable of performing all of the functions listed in the services section of this document. The contractor must have experience in transmission line design and must be geographically located so that they can be quickly mobilized after a storm event. The data collection team should have technical and transmission line design knowledge and have access to failure analysis experts so that the nature and cause of an failures can be analyzed.

Pre-storm Requirements

When the Storm Coordinator activates the storm plan prior to a storm event, one or more of the Forensic contractors will be notified that their service will be required. The forensic contractor will then mobilize their forensic team and will make preparations to support the forensic data collection requirements. Once the storm event has passed, the forensic contractor will be contacted by the logistic center coordinator and will be directed to affected region storm center where the region storm center coordinator will direct the team to the damaged zones.

Post Storm Requirements

Data Collection

The contractor shall collect sufficient data at the failure sites to determine the nature and cause of the failure. Data collection shall include the following:

- Structure identification
- Photographs
- Sample of damaged components as necessary
- Field technical assessment (soil conditions, exposure, vegetation, etc)
- Inventory of attachments and guys

Forensic Analysis

Data and forensic samples will be analyzed to determine the cause and correlating factors contributing to the failure. Analysis will include as required:

- Conditional assessment of failed components
- Structural evaluations
- Failure analysis
- Correlation with storm path and intensity
- Correlation with GIS data
- Correlation with original design basis
- Correlation to past maintenance

Reporting

The contractor will prepare a report containing the findings and assessments from the above described analysis. This report shall contain at minimum:

Diagram of storm path and intensity isobars and scatter chart of failed facilities

Summary table of failed facilities including:

- Type of facility (wood pole, steel tower, etc)
- Vintage
- Maintenance History
- Photographs
- Comparison of failure(s) to design basis
- Professional assessment as to cause of failure