

BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

In re: Review of 2019-2021 storm hardening
plan, Duke Energy Florida, LLC.

DOCKET NO. 20180146-EI
ORDER NO. PSC-2019-0312-PAA-EI
ISSUED: July 29, 2019

The following Commissioners participated in the disposition of this matter:

ART GRAHAM, Chairman
JULIE I. BROWN
DONALD J. POLMANN
GARY F. CLARK
ANDREW GILES FAY

NOTICE OF PROPOSED AGENCY ACTION
ORDER APPROVING DUKE ENERGY FLORIDA, LLC'S
UPDATED STORM HARDENING PLAN FOR 2019-2021

BY THE COMMISSION:

NOTICE is hereby given by the Florida Public Service Commission that the action discussed herein is preliminary in nature and will become final unless a person whose interests are substantially affected files a petition for a formal proceeding, pursuant to Rule 25-22.029, Florida Administrative Code (F.A.C.).

Background

The hurricanes of 2004 and 2005 that made landfall in Florida resulted in extensive storm restoration costs and lengthy electric service interruptions for millions of electric investor-owned utility (IOU) customers. On January 23, 2006, the Florida Public Service Commission (Commission) staff conducted a workshop to discuss the damage to electric utility facilities resulting from these hurricanes and to explore ways of minimizing future storm damage and customer outages. State and local government officials, independent technical experts, and Florida's electric utilities participated in the workshop.

On February 27, 2006, we issued Order No. PSC-06-0144-PAA-EI, in Docket No. 20060078-EI, requiring that the IOUs begin implementing an eight-year inspection cycle of their respective wooden poles.¹ In that Order, we noted:

¹Docket No. 20060078-EI, In re: Proposal to require investor-owned electric utilities to implement ten-year wood pole inspection program.

The severe hurricane seasons of 2004 and 2005 have underscored the importance of system maintenance activities of Florida's electric IOUs. These efforts to maintain system components can reduce the impact of hurricanes and tropical storms upon utilities' transmission and distribution systems. An obvious key component in electric infrastructure is the transmission and distribution poles. If a pole fails, there is a high chance that the equipment on the pole will be damaged, and failure of one pole often causes other poles to fail. Thus, wooden poles must be maintained or replaced over time because they are prone to deterioration. Deteriorated poles have lost some or most of their original strength and are more prone to fail under certain environmental conditions such as high winds or ice loadings. The only way to know for sure which poles...must be replaced is through periodic inspections. [p. 2]

On April 25, 2006, we issued Order No. PSC-06-0351-PAA-EI, in Docket No. 20060198-EI, requiring all IOUs to file plans and estimated implementation costs for 10 ongoing storm preparedness initiatives (Ten Initiatives) on or before June 1, 2006.² The Ten Initiatives are:

1. A Three-Year Vegetation Management Cycle for Distribution Circuits
2. An Audit of Joint-Use Attachment Agreements
3. A Six-Year Transmission Structure Inspection Program
4. Hardening of Existing Transmission Structures
5. A Transmission and Distribution Geographic Information System
6. Post-Storm Data Collection and Forensic Analysis
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

These Ten Initiatives were not intended to encompass all reasonable ongoing storm preparedness activities. Rather, we viewed these initiatives as a starting point of an ongoing process.³ By Order Nos. PSC-06-0781-PAA-EI addressing Tampa Electric Company (TECO) and Florida Public Utilities Company (FPUC), PSC-06-0947-PAA-EI addressing Progress Energy Florida, Inc. [now Duke Energy Florida, LLC (DEF or Utility)] and Gulf Power Company (Gulf), and PSC-07-0468-FOF-EI addressing Florida Power & Light Company (FPL), we addressed the adequacy of the IOU's plans for implementing the Ten Initiatives.

²Docket No. 20060198-EI, In re: Requirement for investor-owned electric utilities to file ongoing storm preparedness plans and implementation cost estimates.

³Order No. PSC-06-0351-PAA-EI, p. 2, issued April 25, 2006, in Docket No. 20060198-EI, In re: Requirement for investor-owned electric utilities to file ongoing storm preparedness plans and implementation costs estimates.

We also pursued rulemaking to address the adoption of distribution construction standards more stringent than the minimum safety requirements of the National Electrical Safety Code (NESC) and the identification of areas and circumstances where distribution facilities should be required to be constructed underground.⁴ Rule 25-6.0342, F.A.C., was ultimately adopted.⁵

Rule 25-6.0342, F.A.C., requires each IOU to file an Electric Infrastructure Storm Hardening Plan for review and approval by this Commission which includes a description of construction standards, policies, practices, and procedures to enhance the reliability of overhead and underground electrical transmission and distribution facilities. The rule calls for, at a minimum, each IOU's plan to address the following items:

- a. Compliance with the NESC
- b. Extreme Wind Loading (EWL) standards for:
 - i. New construction
 - ii. Major planned work, including expansion, rebuild, or relocation of existing facilities
 - iii. Critical infrastructure facilities and along major thoroughfares
- c. Mitigation of damage due to flooding and storm surges
- d. Placement of facilities to facilitate safe and efficient access for installation and maintenance
- e. A deployment strategy that includes:
 - i. The facilities affected
 - ii. Technical design specifications, construction standards, and construction methodologies
 - iii. The communities and areas where the electric infrastructure improvements are to be made
 - iv. The impact on joint-use facilities on which third-party attachments exist
 - v. An estimate of the costs and benefits to the utility of making the electric infrastructure improvements

⁴Order No. PSC-06-0556-NOR-EU, issued June 28, 2006, in Docket No. 20060172-EU, In re: Proposed rules governing placement of new electric distribution facilities underground, and conversion of existing overhead distribution facilities to underground facilities, to address effects of extreme weather events; and Docket No. 20060173-EU, In re: Proposed amendments to rules regarding overhead electric facilities to allow more stringent construction standards than required by National Electric Safety Code.

⁵Order No. PSC-07-0043-FOF-EU, issued January 16, 2007, as amended by Order No. PSC-07-0043AFOF-EU, issued January 17, 2007, in Docket No. 20060172-EU, In re: Proposed rules governing placement of new electric distribution facilities underground, and conversion of existing overhead distribution facilities to underground facilities, to address effects of extreme weather events; and Docket No. 20060173-EU, In re: Proposed amendments to rules regarding overhead electric facilities to allow more stringent construction standards than required by National Electric Safety Code.

- vi. An estimate of the costs and benefits to third-party attachers affected by the electric infrastructure improvements

f. The inclusion of Attachment Standards and Procedures for Third-Party Attachers

FPL filed its 2016-2018 storm hardening plan updates on March 15, 2016, which was consolidated with its petition for rate increase. FPL's plan was approved at the November 29, 2016 Commission Conference through a settlement.⁶ On May 2-3, 2016, the other four IOU's filed their 2016-2018 storm hardening plan updates. We approved the storm hardening plans for DEF, FPUC, TECO, and Gulf, at the December 6, 2016 Commission Conference.⁷

After four hurricanes impacted Florida in 2016-2017, we opened Docket No. 20170215-EU to review electric utility storm preparedness and restoration actions (Hurricane Review Docket), and to identify areas where infrastructure damage, outages, and recovery time for customers could be minimized in the future. On May 2-3, 2018, we held a workshop during which information was presented by utilities, customers and their representatives, and local governments. Topics discussed at the workshop included preparation and restoration processes, hardened versus non-hardened facility performance, underground versus overhead performance, impediments to restoration, customer and stakeholder communication, and suggested improvements based on lessons learned.

On July 24, 2018, we issued our "Review of Florida's Electric Utility Hurricane Preparedness and Restoration Action's 2018."⁸ At the July 10, 2018 Internal Affairs meeting, we directed Commission staff to open the storm hardening plan review dockets earlier than previously scheduled and to begin collecting additional details related to:

- Meetings with local governments regarding vegetation management and the identification of critical facilities.
- Utility staffing practices at local emergency operations centers (EOC).
- Planned responses to roadway congestion, motor fuel availability, and lodging accommodation issues.
- Alternatives considered before electing a particular storm hardening project.

⁶Order No. PSC-16-0560-AS-EI, issued December 15, 2016, in Docket No. 20160021-EI, In re: Petition for rate increase by Florida Power & Light Company.

⁷Order No. PSC-16-0569-PAA-EI, issued December 19, 2016, in Docket No. 20160105-EI, In re: Petition for approval of 2016-2018 storm hardening plan, pursuant to Rule 25-6.0342, F.A.C., by Tampa Electric Company; Order No. PSC-16-0570-PAA-EI, issued December 19, 2016, in Docket No. 20160106-EI, In re: Petition for approval of 2016-2018 storm hardening plan, pursuant to Rule 25-6.0342, F.A.C., by Florida Public Utilities Company; Order No. PSC-16-0571-PAA-EI, issued December 19, 2016, in Docket No. 20160107-EI, In re: Petition for approval of 2016-2018 storm hardening plan, pursuant to Rule 25-6.0342, F.A.C., by Duke Energy Florida, LLC.; Order No. PSC-16-0572-PAA-EI, issued December 19, 2016, in Docket No. 20160108-EI, In re: Petition for approval of 2016-2018 storm hardening plan, pursuant to Rule 25-6.0342, F.A.C., by Gulf Power Company.

⁸ Document No. 04847-2018, issued July 24, 2018, in Docket No. 20170215-EU, In re: Review of electric utility hurricane preparedness and restoration actions.

- The collection of more uniform performance data for hardened versus non-hardened and underground facilities, including sampling data where appropriate.

On March 1, 2019, the five IOUs filed their 2019-2021 storm hardening plan updates as requested. Docket Nos. 20180144-EI (FPL), 20180145-EI (TECO), 20180146-EI (DEF), 20180147-EI (Gulf) and 20180148-EI (FPUC) were opened. Commission staff did not conduct a workshop for these updated storm hardening plans as data request responses were sufficient in understanding the updated plans.

This order addresses DEF's plan updates as required by Rule 25-6.0342, F.A.C. Our order addresses:

- I. Wooden Pole Inspection Program
- II. Ten Initiatives
- III. National Electric Safety Code (NESC) Compliance
- IV. Extreme Wind Loading (EWL) Standards
- V. Mitigation of Flooding and Storm Surge Damage
- VI. Facility Placement
- VII. Deployment Strategies
- VIII. Attachment Standards and Procedures for Third-Party Attachments

Attachment A describes the storm hardening requirements of the Wooden Pole Inspection Program and the Ten Initiatives for each IOU. Attachment B contains a comparison of DEF's provisions of the 2016-2018 approved and updated 2019-2021 Wooden Pole Inspection Programs and Ten Initiatives, and the cost of implementing the approved and updated programs and initiatives.

We have jurisdiction over this matter pursuant to Sections 366.04 and 366.05, Florida Statutes (F.S.).

Decision

On Attachment B, we provide a summary of DEF's current Wooden Pole Inspection Program and Ten Initiatives and the proposed changes. In addition, where available, we have shown the costs associated with the Wooden Pole Inspection Programs and Ten Initiatives for 2016-2018 and 2019-2021. Components of DEF's updated plan are summarized below.

Wooden Pole Inspection Program

DEF proposes to continue its eight-year Wooden Pole Inspection Program.⁹ The program includes inspection of DEF's transmission, distribution, and joint-use wooden poles. Poles are identified that require repair, reinforcement or replacement. Currently, DEF has completed its fourth year of its second eight-year cycle. DEF will continue to file the results of these inspections in its Annual Electric Utility Distribution Reliability Report. The estimated cost for 2019-2021 related to the eight-year wooden pole inspection is \$12,500,000 as compared to \$12,300,000 spent for 2016-2018.

Ten Initiatives

Initiative One – Three-Year Vegetation Management Cycle for Distribution Circuits

DEF proposes no changes to its previously approved trim cycle. Currently, its feeder and lateral circuits are trimmed, on average, every three years and five years, respectively.¹⁰ DEF reported that annual variations for projected miles to be trimmed are expected as the Utility manages its resources and unit cost factors associated with its vegetation management. The estimated cost for 2019-2021 for Initiative One is \$151,300,000 as compared to \$98,050,000 spent in 2016-2018.

Initiative Two – Audits of Joint-Use Attachment Agreements

There are no proposed changes to the plan for this initiative. DEF will conduct an audit of all pole attachments on an eight-year cycle at a minimum.¹¹ DEF conducts partial audits of its pole attachments throughout the year. The Utility performs a full Joint-Use Pole Loading Analysis on an eight-year cycle. DEF reported that when it discovers unauthorized attachments on its poles, it follows up with the unauthorized attacher. DEF explained that for each group of poles in a tangent line, the pole that had the most visible loading, line angle, and longest or uneven span length was selected for wind loading analysis. If that pole failed, the next worst-case pole would be analyzed as well. The estimated cost for 2019-2021 is \$1,320,000 as compared to \$1,329,000 spent in 2016-2018.

Initiative Three – Six-Year Transmission Structure Inspection Program

There are no proposed changes to the plan for this initiative. DEF's transmission structure inspection program is on a five-year cycle. DEF inspects transmission circuits, substations, tower structures and poles. DEF performs ground patrol of transmission line structures, associated hardware, and conductors on a routine basis to identify potential problems. DEF reported that the

⁹Order No. PSC-06-0144-PAA-EI, issued February 27, 2006, in Docket No. 20060078-EI, *In re: Proposal to require investor-owned electric utilities to implement ten-year wood pole inspection program.*

¹⁰Order No. PSC-06-0947-PAA-EI, issued November 13, 2006, in Docket No. 20060198-EI, *In re: Requirement for investor-owner electric utilities to file ongoing storm preparedness plans and implementation cost estimates.*

¹¹Order No. PSC-06-0351-PAA-EI, issued April 25, 2006, in Docket No. 20060198-EI, *In re: Requirement for investor-owned electric utilities to file ongoing storm preparedness plans and implementation cost estimates.*

estimated and actual amounts for the transmission inspections include the inspections, emergency response, preventative maintenance, and training. For this initiative, DEF spent \$22,372,000 in 2016-2018. For 2019, DEF provided an estimated cost of \$8,250,000; however, estimated costs for 2020 and 2021 were not available at this level of detail.

Initiative Four – Hardening of Existing Transmission Structures

There are no proposed changes in the plan for this initiative. DEF will continue to harden its transmission structures, which includes maintenance pole change-outs, insulator replacements, Department of Transportation/customer relocations, line rebuilds, and system planning additions. DEF notes that the transmission structures are designed to withstand the current NESC requirements and are built utilizing steel or concrete structures. For this initiative, DEF spent \$405,916,000 in 2016-2018. For 2019, DEF provided an estimated cost of \$160,188,000; however, estimated costs for 2020 and 2021 were not available at this level of detail. DEF reported that there was a decrease in governmental (projects requested by the Department of Transportation) and rebuild (projects which will include a complete replacement of transmission line structures, conductors, and all supporting equipment) projects over the last three years.

Initiative Five – Transmission and Distribution Geographic Information System (GIS)

There are no proposed changes to the plan for this initiative. DEF implemented a new GIS, Work Management System, and Asset Management System in 2017, and it is expected that all transmission line assets will be entered into the GIS by the end of 2020. With the utilization of these systems, DEF is able to facilitate compliance tracking, maintenance, planning, and risk management of the major distribution and transmission assets. DEF has created and enhanced key performance indicators that are used to measure and monitor the quality of its GIS and Outage Management System (OMS) data. DEF reports that the consistency, accuracy, and dependability of these systems have led to improvements in the reliability and performance of its system, and it has also contributed to the safety of DEF's field employees. Initiative Five is part of DEF's normal business; therefore, DEF does not track or project the costs associated with this initiative.

Initiative Six – Post-Storm Data Collection and Forensic Analysis

There are no proposed changes to the plan for this initiative. DEF has established forensic teams that collect information regarding poles damaged during storm events and data at failure sites to determine the nature and causes of failure. DEF also collects available performance information on overhead and underground facilities as part of its storm restoration process. In collaboration with University of Florida's Public Utility Research Center (PURC), DEF and the other IOUs developed a common format to collect and track data related to damage discovered during forensic investigations. In addition, weather stations were installed across Florida as part of the collaboration with PURC and the other IOUs. As a result, DEF is now able to correlate experienced outages with nearby wind speeds. This type of information is augmented with on-site forensic data following a major storm event. For this initiative, DEF spent \$327,400 in 2016-

2018. For 2019, DEF provided an estimated cost of \$257,500; however, estimating the cost is difficult as it will depend on whether DEF is impacted by a major storm event and the level of damage.

Initiative Seven – Collection of Detailed Outage Data Differentiating Between the Reliability Performance of Overhead and Underground Systems

There are no proposed changes to the plan for this initiative. As referenced above, DEF collects available performance information on overhead and underground facilities as part of its storm restoration process. DEF uses its OMS, its Customer Service System, and GIS to help analyze the percentage of storm caused outages on overhead and underground systems. One hundred percent of the overhead and underground distribution systems are in the GIS, as well as one hundred percent of the underground transmission system. For the overhead transmission system, there is less than one percent of the data remaining to be entered into the GIS, which should be completed by 2020. Initiative Seven is part of DEF's normal business; therefore, DEF does not track or project the costs associated with this initiative.

In response to information requested in the Hurricane Review Docket, DEF outlined the type of comparable data that the Utility plans to provide for overhead and underground facilities. For performance comparisons between hardened versus non-hardened facilities for wind impacts, DEF will conduct Forensic Damage Assessments of both types of facilities immediately following extreme weather events. A database of hardened line segments and comparative non-hardened line segments in the same area will be used, ensuring that both samples assessed experienced similar extreme weather conditions. Since underground facilities are more susceptible to storm surge and water intrusion, and overhead facilities are more susceptible to debris being blown by high winds, another means of comparison is needed to complement the Forensic Damage Assessment., such as reliability trends over a period of time.

Initiative Eight – Increased Coordination with Local Governments

There are no proposed changes to the plan for this initiative. DEF's storm planning and response program is operational year-round with over 40 employees assigned full-time to coordinate with local governments on issues such as emergency planning, vegetation management, undergrounding, and service related issues. DEF will continue to visit the different EOCs to review storm procedures and participate in several different storm drills. DEF also offers electronic outage information that can be imported into county GIS systems, as well as an interactive outage map that provides county-specific power restoration estimates. Initiative Eight is part of DEF's normal business; therefore, DEF does not track or project the costs associated with this initiative.

In response to information requested in the Hurricane Review Docket, DEF discussed its coordination with local governments regarding vegetation management and identification of critical facilities. DEF meets with cities and counties prior to initiating a vegetation management projects in local areas, and works with local governments regarding the "Right Tree, Right Place" concept. DEF also works with local governments and county EOCs to identify and

prioritize infrastructure and feeder circuits that are determined to be critical prior to a storm. DEF identified over 90 meetings with cities and counties in 2018, including topics that were discussed and any pending or follow-up issues, such as addressing hurricane preparedness and response.

DEF has six Government and Community Relations Managers who act as the main point of contact for communities during a storm event. Additionally, for EOCs that are not staffed in person, a manager or representative will provide the needed support by phone. While there are one or more designated DEF employees assigned to each EOC, staffing is scalable and will depend on the individual storm.

Initiative Nine – Collaborative Research on Effects of Hurricane Winds and Storm Surge

There are no proposed changes to the plan for this initiative. DEF will continue to participate in the collaborative research effort with the other Florida IOUs, municipals and cooperatives. The collaborative research is facilitated by PURC at the University of Florida and focuses on: (1) undergrounding of electric utility infrastructure; (2) hurricane wind effects; and (3) public outreach. DEF signed an extension of the memorandum of understanding with PURC in December 2018 for two years, with a provision that the memorandum of understanding will be automatically extended for successive two-year terms. In addition to DEF's involvement with PURC, DEF actively engages as both participant and presenter with different organizations. These organizations, such as, Southeastern Electric Exchange, Edison Electric Institute, and Institute of Electrical and Electronics Engineers, review and assess hardening alternatives. Initiative Nine is part of DEF's normal business; therefore, DEF does not track or project the costs associated with this initiative.

Initiative Ten – Natural Disaster Preparedness and Recovery Program

DEF will continue to refine this initiative. DEF's storm recovery plan is reviewed and updated annually based on lessons learned from the previous storm season and organizational needs. The Distribution System Storm Operational Plan and the Transmission Storm Plan incorporates organizational redesign at DEF, internal feedback, suggestions, and customer survey responses. DEF uses the EWL standards in accordance with the NESC in all planning of transmission upgrades, rebuilds and expansions of existing facilities. Initiative Ten is part of DEF's normal business; therefore, DEF does not track or project the costs associated with this initiative.

In response to information requested in the Hurricane Review Docket, DEF provided its contingency plans for roadway congestion, fuel availability, and lodging accommodation issues. In the event of roadway congestion, DEF communicates with the Department of Transportation and highway patrol/police escorts to determine which roadways are safe and for assistance in route selection. Plans for fuel and lodging are reviewed and updated annually to assure the resources are available in the event of a storm. These resources are secured prior to landfall, and if needed, DEF coordinates with the State EOC and county EOCs for additional support.

National Electrical Safety Code Compliance

DEF's 2019-2021 storm hardening plan is based on accepted industry practices designed to meet or exceed the requirements of the NESC. These standards, practices, policies, and procedures are followed on all new construction, rebuilding, and relocations of existing facilities. DEF utilizes construction Grade B for all its transmission facilities. DEF utilizes construction Grade C to design its distribution facilities at all places except for those locations where construction Grade B is required per NESC Section 242. The Grades of construction are specified in the NESC on the basis of the required strengths for safety. The relative order of Grades is B, C, and N, with Grade B being the highest.

Extreme Wind Loading Standards

All DEF new transmission structures are being designed to comply with the NESC Rule 250C EWL. DEF uses pole loading software, PoleForeman and PLS-CADD, to assure compliance with all NESC loading requirements. DEF utilizes the PLS-CADD software to design transmission facilities. PoleForeman is used to design distribution facilities. Most DEF distribution poles are less than 60 feet in height. DEF states that all its distribution poles shorter than 60 feet meet the loading requirements of NESC Rules 261A1c, 261A2e, or 261A3d for extreme wind.

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 60 feet above ground and are being designed using the NESC EWL criteria. Construction Grade B is utilized for new construction, replacements, and relocations of transmission facilities. DEF indicated that the NESC does not call for the extreme wind design standard for distribution poles under 60 feet in height. However, as discussed above, all DEF distribution poles shorter than 60 feet meet the loading requirements of NESC Rules 261A1c, 261A2e, or 261A3d for extreme wind, which imply compliance with NESC Rule 250C EWL.

Major Planned Work

DEF utilizes NESC Rule 250C EWL for all major planned transmission work, including expansions, rebuilds, and relocation of existing facilities. DEF's distribution poles meet the loading requirements of NESC Rules 261A1c, 261A2e, or 261A3d for extreme wind, which imply compliance with NESC Rule 250C EWL.

Critical Infrastructure (CIF)

DEF stated in its filing that it has not adopted the extreme wind standard for its distribution level critical infrastructure. However, DEF has also stated that its poles shorter than 60 feet meet the extreme wind loading requirements of NESC Rule 250C EWL when analyzed

without conductors, which is what the NESC requires. DEF believes that installing 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 fallen trees or flying debris such as roofs or signs. DEF states that its current level of construction, around critical facilities and around all other facilities, has performed well during weather events. DEF indicated that there were no storm hardened structures failures during the 2017 and 2018 hurricanes.

Mitigation of Flooding and Storm Surge Damage

In areas where underground equipment may be exposed to minor storm surge and/or shorter-term water intrusion, DEF has used its prioritization model 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: (1) stainless steel equipment; (2) submersible connectors; raised mounting boxes; (3) cold shrink sealing tubes; and (4) submersible secondary blocks. DEF will continue to adapt its flood and storm surge strategies based on information that it collects, as well as information gathered by other utilities in Florida and throughout the nation. 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 by the storm surge. DEF is reviewing its current specifications to determine if other solutions exist.

Facility Placement

DEF reported that it will continue to use front lot construction for all new distribution facilities and all replacement distribution facilities unless specific operational, safety, or other site-specific reasons exist. As specified in DEF's Distribution Engineering Manual, lines outside of a residential development should be located to allow for truck access and reduced tree exposure and trimming on one side of the line when possible.

Deployment Strategies

DEF engaged Davies Consulting to develop a comprehensive prioritization model. DEF uses the model to help identify potential hardening projects, procedures, and strategies. DEF reported that the model has been improved and enhanced to better reflect the changes in its overall storm hardening strategy throughout the years. DEF will continue to adjust its prioritization model as appropriate.

DEF's prioritization model is set up to analyze hardening alternatives as part of its Grid Investment Plan (GIP). The GIP includes:

- Targeted Underground Program (TUG): This activity attempts to eliminate tree and debris related outages by converting heavily vegetated neighborhoods prone to power

outages from overhead to underground facilities to decrease outages, reduce momentary interruptions, improve major storm restoration time, and reduce costs.

- Deteriorated Conductor Program: This activity replaces over burdened overhead conductors that are prone to outages due to its brittle composition, small load capacity and poor connection qualities. The small copper conductor will be replaced with aluminum conductors to improve overall reliability.
- Transformer Retrofit Program: This activity retrofits Completely Self-Protected (CSP) transformers. The retrofit activity includes replacing aged or problematic fuse cutouts and adding fuses where they previously did not exist. In addition, the retrofit includes adding external fused cutouts, replacing bare copper wires with covered copper, and adding animal mitigation. DEF indicated that the retrofitting of the CSP transformers in lieu of replacing the transformers is a cost-effective method of reducing outages.
- Self-Optimizing Grid (Program: This activity will utilize automated switching devices (ASDs) and an automation program to isolate faults and automatically reconfigure the system to reduce the number of customers experiencing an outage. SOG program will provide:
 - Connectivity with automated switching.
 - Capacity on the circuits to allow most circuits to be restored from alternate sources.
 - Automated control with Supervisory Control and Data Acquisition (SCADA)-enable ASDs to isolate faults and reconfigure the system.
 - Segmentation such that distribution circuits have much smaller line segments, which reduces the number of customers affected by outages.
- Live Front Switchgear Replacement Program: This activity will replace aged Live Front Switchgear prior to failure. This will improve overall reliability, result in faster outage restoration and improve safety when working in the switchgears.

The development of the prioritization model begins with DEF's engineers and field personnel providing a list of desired projects. The projects are evaluated based on the following criteria:

- Major storm outage reduction impact
- Community storm impact
- Third-party impact
- Overall reliability
- Financial cost

Facilities Affected, Including Specifications and Standards

All of DEF's facilities are affected by its standards, policies, procedures, practices, and applications discussed in its storm hardening plan. Specific facility types are addressed within

the plan (e.g., upgrading all transmission poles to concrete and steel, using front lot construction for all new distribution lines where possible). As a result, all areas of DEF's service territory are impacted by its storm hardening efforts.

Areas of Infrastructure Improvements

All areas of DEF's service territory are impacted by its storm hardening efforts. Below is a list of the proposed 2019-2021 distribution projects:

- Apopka: two overhead (OH) to underground (UG) conversion, one backlot conversion, six transformer retrofit, one SOG, eight deteriorated conductor, one TUG, and two switchgear replacement.
- Buena Vista: one deteriorated conductor, two feeder tie, one SOG, nine switchgear replacement, three transformer retrofit, and one TUG.
- Clearwater: two deteriorated conductor, one SOG, two switchgear replacement, and four TUG.
- Clermont: one feeder tie and one TUG.
- Deland: nine deteriorated conductor, two SOG, one transformer retrofit, and eleven TUG.
- Highlands: two deteriorated conductor, five feeder tie, three transformer retrofit and one SOG.
- Inverness: one backlot conversion, six submersible UG, five switchgear replacement, two transformer retrofit, and twenty-nine TUG.
- Jamestown: four SOG, one deteriorated conductor, eleven switchgear replacement, and one TUG.
- Lake Wales: three deteriorated conductor, one feeder tie, two SOG, four transformer retrofit, and five TUG.
- Longwood: one OH to UG conversion, one SOG, five transformer retrofit, and three TUG.
- Monticello: three deteriorated conductor, two feeder tie, twelve transformers retrofit, one SOG, and forty-three TUG.
- Ocala: two deteriorated conductor, one feeder tie, one SOG, two switchgear replacement, one transformer retrofit, and seven TUG.
- SE Orlando: two OH to UG conversion, one switchgear replacement, seven transformer retrofit, and two deteriorated conductor.
- Seven Springs: two deteriorated conductor, two feeder tie, one switchgear replacement, three TUG.
- St. Petersburg: one feeder tie, one SOG, two transformer retrofit, and one TUG.
- Walsingham: two transformer retrofit and six TUG.

- Winter Garden: one deteriorated conductor, two feeder tie, one SOG, four switchgear replacement and one transformer retrofit.
- Zephyrhills: one deteriorated conductor and two TUG.

DEF's approach in deciding the storm hardening projects is to consider the unique circumstances of each potential location. Below are the variables DEF considers:

- Operating history and environment
- Community impact and customer input
- Exposure to storm surge and flooding
- Equipment condition
- Historical and forecast storm experience
- Potential impacts on third-parties

DEF believes this approach leads to the best solution for each discrete segment of its system. As discussed in Initiative Four, DEF is planning to continue to replace transmission poles with either concrete or steel poles. Most projects are identified during the transmission pole inspections. For the North Florida area, DEF listed 56 new, rebuilds, or relocation projects for its transmission system. The projects are planned over the three-year period 2019 through 2021. For the South Florida area, DEF listed 90 transmission projects for the same time period.

Joint-Use Facilities

In accordance with DEF's Joint-Use Pole Attachment Guidelines, DEF notifies third-parties that transfers are needed when DEF determines that a pole replacement is necessary. DEF conducts joint-use pole attachment audits on a seven-year cycle, with its most recent audit being completed in 2013. Currently, DEF is in the seventh year of its second round of wooden pole inspections and expects to complete them by year-end 2020. As of year-end 2017, DEF owned approximately 1.1 million electric utility distribution poles and was attached to 16,213 non-electric utility distribution poles.

Utility Cost/Benefit Estimates

DEF's updated plan includes estimates of costs to be incurred in connection with its updated plan for 2019 through 2021. This includes pole replacements, inspections of distribution and transmission facilities, vegetation management, and other projects. For 2016 through 2018, DEF spent a total of \$651,405,943 on its storm hardening plan. DEF estimates it will spend approximately \$179,400,000 for 2019. Attachment B shows a comparison of costs associated with implementation of DEF's current and updated Wooden Pole Inspection Program and Ten Initiatives.

As discussed above, DEF's selection process for storm hardening projects is a combination of the following items: (1) major storm outage reduction; (2) community storm

impact; (3) third-party impact; and (3) overall reliability and cost. In addition, each storm hardening project type utilizes historic reliability information to drive the target selection process, such as the system average interruption frequency index (SAIFI), customers experiencing multiple interruptions (CEMI), and events per miles. DEF's storm hardening projects are reviewed on a case-by-case basis. This provides an added benefit to DEF and its customers to ensure that the right type of storm hardening project is performed for that unique area.

Attachers Cost/Benefit Estimates

DEF provided information to third-parties who would be affected by its storm hardening projects. DEF believes that, in addition to itself, any entity jointly attached to its equipment would benefit from its proposed storm hardening projects. DEF provided available cost/benefit information to the third-party attachers. DEF did not report any responses from third-party attachers regarding cost or benefit information.

Attachment Standards and Procedures

DEF's updated plan includes Joint-Use Pole Attachment Guidelines addressing its joint-use process, construction standards, timelines, financial responsibilities, and key Utility contacts responsible for completing permit requests. DEF reports that all newly proposed joint-use attachments are field checked and designed using generally accepted engineering practices to assure that the new attachments do not overload the poles.

Conclusion

DEF's updated plan is largely a continuation of its current Commission-approved plan. Based on the review above, DEF's plan has the information required by our rule and orders and we therefore find it shall be approved. We note that approval of DEF's plan does not mean approval for cost recovery. DEF should consider the rate impact before taking proactive steps to improve its system to withstand severe weather events.

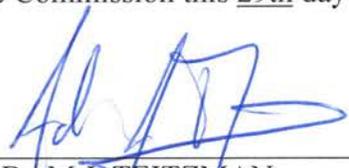
Based on the foregoing, it is

ORDERED by the Florida Public Service Commission that Duke Energy Florida, LLC's 2019-2021 storm hardening plan is hereby approved. It is further

ORDERED that the provisions of this Order, issued as proposed agency action, shall become final and effective upon the issuance of a Consummating Order unless an appropriate petition, in the form provided by Rule 28-106.201, Florida Administrative Code, is received by the Commission Clerk, 2540 Shumard Oak Boulevard, Tallahassee, Florida 32399-0850, by the close of business on the date set forth in the "Notice of Further Proceedings" attached hereto. It is further

ORDERED that in the event this Order becomes final, this docket shall be closed.

By ORDER of the Florida Public Service Commission this 29th day of July, 2019.



ADAM J. TEITZMAN
Commission Clerk
Florida Public Service Commission
2540 Shumard Oak Boulevard
Tallahassee, Florida 32399
(850) 413-6770
www.floridapsc.com

Copies furnished: A copy of this document is provided to the parties of record at the time of issuance and, if applicable, interested persons.

WLT

NOTICE OF FURTHER PROCEEDINGS OR JUDICIAL REVIEW

The Florida Public Service Commission is required by Section 120.569(1), Florida Statutes, to notify parties of any administrative hearing that is available under Section 120.57, Florida Statutes, as well as the procedures and time limits that apply. This notice should not be construed to mean all requests for an administrative hearing will be granted or result in the relief sought.

Mediation may be available on a case-by-case basis. If mediation is conducted, it does not affect a substantially interested person's right to a hearing.

The action proposed herein is preliminary in nature. Any person whose substantial interests are affected by the action proposed by this order may file a petition for a formal proceeding, in the form provided by Rule 28-106.201, Florida Administrative Code. This petition must be received by the Office of Commission Clerk, 2540 Shumard Oak Boulevard, Tallahassee, Florida 32399-0850, by the close of business on August 19, 2019.

In the absence of such a petition, this order shall become final and effective upon the issuance of a Consummating Order.

Any objection or protest filed in this/these docket(s) before the issuance date of this order is considered abandoned unless it satisfies the foregoing conditions and is renewed within the specified protest period.

Storm Hardening Requirements: Wooden Pole Inspection Program & Ten Initiatives

Eight-Year Wooden Pole Inspection Program
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| 1. Implement an eight-year wooden pole inspection cycle by Order Nos. PSC-06-0144-PAA-EI and PSC-07-0078-PAA-EU. |
| 2. File an annual report with the Commission. |
| 3. Provide cost estimates. |

Initiative 1 – A Three-Year Vegetation Management Cycle for Distribution Circuits
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| 1. Three-year tree trim cycle for primary feeders (minimum). |
| 2. Three-year cycle for laterals as well, if not cost-prohibitive. |
| 3. Provide cost estimate. |

Initiative 2 – Audit of Joint-Use Attachment Agreements
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| 1. (a) Each investor-owned electric utility shall develop a plan for auditing joint-use agreements that includes pole strength assessments. |
| (b) These audits shall include both poles owned by the electric utility poles owned by other utilities to which the electric utility has attached its electrical equipment. |
| 2. The location of each pole, the type and ownership of the facilities attached, and the age of the pole and the attachments to it should be identified. |
| 3. Each investor-owned utility shall verify that such attachments have been made pursuant to a current joint-use agreement. |
| 4. Stress calculations shall be made to ensure that each joint-use pole is not overloaded or approaching overloading for instances not already addressed by Order No. PSC-06-0144-PAA-EI. |
| 5. Provide compliance cost estimate and cost estimate for alternative action, if any. |

Initiative 3 – Six-Year Transmission Inspection Program
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| 1. Develop a plan to fully inspect all transmission towers and other transmission supporting equipment (such as insulators, guying, grounding, splices, cross-braces, bolts, etc.). |
| 2. Develop a plan to fully inspect all substations (including relay, capacitor, and switching stations). |
| 3. Provide compliance cost estimate and cost estimate for alternative actions, if any. |

Initiative 4 – Hardening of Existing Transmission Structures

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| 1. Develop a plan to upgrade and replace existing transmission structures. Provide a scope of activity, limiting factors, and criteria for selecting structure to upgrade and replace. |
| 2. Provide a timeline for implementation. |
| 3. Provide compliance cost estimate and cost estimate for alternative actions, if any. |

Initiative 5 – Transmission and Distribution Geographic Information System
1. To conduct forensic review.
2. To assess the performance of underground systems relative to overhead systems.
3. To determine whether appropriate maintenance has been performed.
4. To evaluate storm hardening options.
5. Provide a timeline for implementation.
The utilities have the flexibility to propose a methodology that is efficient and cost-effective.

Initiative 6 – Post-Storm Data Collection and Forensic Analysis
1. Develop a program that collects post-storm information for performing forensic analyses.
2. Provide a timeline for implementation.
The utilities have the flexibility to propose a methodology that is efficient and cost-effective.

Initiative 7 – Collection of Detailed Outage Data Differentiating between the Reliability Performance of Overhead and Underground Systems
1. Collect specific storm performance data that differentiates between overhead and underground systems, to determine the percentage of storm-caused outages that occur on overhead and underground systems, and to assess the performance and failure mode of competing technologies, such as direct bury cable versus cable-in-conduit, concrete poles versus wooden poles, location factors such as front-lot versus back-lot, and pad-mounted versus vault.
2. Provide a timeline for implementation.
The utilities have the flexibility to propose a methodology that is efficient and cost-effective.

Initiative 8 – Increased Coordination with Local Governments
1. Each utility should actively work with local communities year-round to identify and address issues of common concern, including the period following a severe storm like a hurricane and also ongoing, multi-hazard infrastructure issues such as flood zones, area prone to wind damage, development trends in land use and coastal development, joint-use of public right-of-way, undergrounding facilities, tree trimming, and long-range planning and coordination.
2. Incremental plan costs.

Initiative 9 – Collaborative Research
1. Must establish a plan that increases collaborative research.
2. Must identify collaborative research objective.
3. Must solicit municipals, cooperatives, educational and research institutions.
4. Must establish a timeline for implementation.
5. Must identify the incremental costs necessary to fund the organization and perform the research.

Initiative 10 – A Natural Disaster Preparedness and Recovery Program
1. Develop a formal Natural Disaster Preparedness and Recovery Plan that outlines the utility's disaster recovery procedures if the utility does not already have one.

Duke Energy Florida, LLC

Eight-Year Wooden Pole Inspection Program	
Current Plan	Updated Plan
1. Implement an eight-year wooden pole inspection cycle for distribution poles.	1. No change
2. File the progress of this inspection in the Annual Reliability Report.	2. No change
3. Costs for 2016-2018 were \$12,300,000.	3. Costs for 2019-2021 are estimated to be \$12,500,000.

Initiative 1 – A Three-Year Vegetation Management Cycle for Distribution Circuits	
Current Plan	Updated Plan
1. Implement a three-year average trim cycle for feeders with targeted feeder trims based on prioritization.	1. No change
2. Implement an average five-year trim cycle for laterals.	2. No change
3. Costs for 2016-2018 were \$98,050,000.	3. Costs for 2019-2021 are estimated to be \$151,300,000.

Initiative 2 – Audit of Joint-Use Attachment Agreements	
Current Plan	Updated Plan
1. (a) Perform a Comprehensive Loading Analysis and annual partial system audits.	1. (a) No change
(b) Audit all DEF-owned and joint-use poles during eight-year wooden pole inspection cycle.	(b) No change
2. All required data collected on select poles and stored in electronic format.	2. No change
3. Verify attachments have been made pursuant to current joint-use agreements.	3. No change
4. Stress calculations performed on select poles during eight-year wooden pole inspection cycle.	4. No change
5. Cost for 2016-2018 were \$1,329,000.	5. Costs for 2019-2021 are estimated to be \$1,320,000.

Initiative 3 – Six-Year transmission Inspection Program	
Current Plan	Updated Plan
1. Inspection program is multi-pronged approach with inspection cycles of one, five, or eight years depending on the goals or requirements of the individual inspection activity.	1. No change
2. Annual substation inspections.	2. No change
3. Costs for 2016-2018 were \$22,372,000.	3. Costs for 2019 are estimated to be \$8,250,000. Estimates for 2020 and 2021 are not available.

Initiative 4 – Hardening of Existing Transmission Structures	
Current Plan	Updated Plan
1. Incremental upgrades during relocations, replacement of existing wooden transmission pole, and other maintenance.	1. No change
2. Plan completed in 10 or more years starting in 2007.	2. No change
3. Costs for 2016-2018 were \$405,916,000.	3. Costs for 2019 are estimated to be \$160,188,000. Estimates for 2020 and 2021 are not available.

Initiative 5 – Transmission and Distribution Geographic Information System	
Current Plan	Updated Plan
1. Plan includes forensic review.	1. No change
2. Plan includes underground system relative to overhead.	2. No change
3. Plan includes determination of appropriate maintenance.	3. No change
4. Plan includes evaluation of storm hardening options.	4. No change
5. Continue use of G-electric system	5. No change

Initiative 6 – Post-Storm Data Collection and Forensic Analysis	
Current Plan	Updated Plan
1. DEF has forensic teams in place and will collect and analyze samples.	1. No change
2. Plan continues to be implemented as severe weather events occur.	2. No change

Initiative 7 – Collection of Detailed Outage Data Differentiating between the Reliability Performance of Overhead and Underground Systems	
Current Plan	Updated Plan
1. DEF’s Storm Preparedness Plan has been initiated.	1. No change
2. Implement in 2007. Storm performance results are obtained from DEF’s GIS.	2. No change

Initiative 8 – Increased Coordination with Local Governments	
Current Plan	Updated Plan
1. DEF focuses on year-round communication with local governments. In addition, DEF implements meetings to discuss city and county projects.	1. No change

Initiative 9 – Collaborative Research	
Current Plan	Updated Plan
1. Collaborative research efforts, led by PURC, which began in 2007.	1. No change
2. Research vegetation management during storm and non-storm times, wind during storm and non-storm events, hurricane and damage modeling towards further understanding the costs and benefits of undergrounding.	2. No change
3. DEF will solicit participation from other utilities and organizations.	3. No change
4. Implementation is ongoing	4. DEF has entered into a Memorandum of Understanding with the University of Florida’s PURC, which extends research through December 31, 2018.

Initiative 10 – A Natural Disaster Preparedness and Recovery Program	
Current Plan	Updated Plan
Disaster Preparedness/Recovery Plan has been developed and filed.	Continue to refine.