

BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

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.

DOCKET NO. 160107-EI  
ORDER NO. PSC-16-0571-PAA-EI  
ISSUED: December 19, 2016

The following Commissioners participated in the disposition of this matter:

JULIE I. BROWN, Chairman  
LISA POLAK EDGAR  
ART GRAHAM  
RONALD A. BRISÉ  
JIMMY PATRONIS

NOTICE OF PROPOSED AGENCY ACTION  
ORDER APPROVING DUKE ENERGY FLORIDA, LLC'S  
UPDATED STORM HARDENING PLAN FOR 2016-2018

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 Rules 25-22.029 and 28-106.201, 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 damages and customer outages. State and local government officials, independent technical experts, and Florida's electric utilities participated in the workshop.

On February 27, 2006, this Commission issued Order No. PSC-06-0144-PAA-EI, in Docket No. 060078-EI, requiring that the IOUs begin implementing an eight-year inspection cycle of their respective wooden poles.<sup>1</sup> In that Order, we noted:

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

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<sup>1</sup>Docket No. 060078-EI, In re: Proposal to require investor-owned electric utilities to implement ten-year wood pole inspection program.

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, this Commission issued Order No. PSC-06-0351-PAA-EI, in Docket No. 060198-EI, requiring all IOUs to file plans and estimated implementation costs for ten ongoing storm preparedness initiatives (Ten Initiatives) on or before June 1, 2006.<sup>2</sup> 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, this Commission viewed these initiatives as a starting point of an ongoing process.<sup>3</sup> By Order Nos. PSC-06-0781-PAA-EI (addressing Tampa Electric Company, and Florida Public Utilities Company), PSC-06-0947-PAA-EI (addressing Progress Energy Florida, Inc., and Gulf Power Company), and PSC-07-0468-FOF-EI (addressing Florida Power & Light Company), this Commission addressed the adequacy of the IOU's plans for implementing the Ten Initiatives.

This Commission also pursued rulemaking to address the adoption of distribution construction standards more stringent than the minimum safety requirements of the National Electric Safety Code (NESC) and the identification of areas and circumstances where

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<sup>2</sup>Docket No. 060198-EI, In re: Requirement for investor-owned electric utilities to file ongoing storm preparedness plans and implementation cost estimates.

<sup>3</sup>Order No. PSC-06-09351-PAA-EI, p.2, issued April 25, 2006, in Docket No. 060198-EI, In re: Requirement for investor-owned electric utilities to file ongoing storm preparedness plans and implementation costs estimates.

distribution facilities should be required to be constructed underground.<sup>4</sup> Rule 25-6.0342, F.A.C., was ultimately adopted.<sup>5</sup>

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
  - 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

On May 3, 2013, the five IOUs filed 2013-2015 storm hardening plan updates. This Commission approved the storm hardening plans for Duke Energy Florida, LLC (DEF), Florida

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<sup>4</sup>Order No. PSC-06-0556-NOR-EU, issued June 28, 2006, in Docket No. 060172-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. 060173-EU, In re: Proposed amendments to rules regarding overhead electric facilities to allow more stringent construction standards than required by National Electric Safety Code.

<sup>5</sup>Order No. PSC-07-0043A-FOF-EU, issued January 17, 2007, in Docket No. 060172-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. 060173-EU, In re: Proposed amendments to rules regarding overhead electric facilities to allow more stringent construction standards than required by National Electric Safety Code.

Public Utilities Company (FPUC), Florida Power and Light Company (FPL), Tampa Electric Company (TECO), and Gulf Power Company (Gulf), at the November 14, 2013 Commission Conference.<sup>6</sup> On May 2 and 3, 2016, four IOUs filed 2016-2018 storm hardening plan updates as required. Docket Nos. 160105-EI (TECO), 160106-EI (FPUC), 160107-EI (DEF) and 160108-EI (Gulf) were opened. FPL filed its 2016-2018 storm hardening plan updates on March 15, 2016, and Docket No. 160061-EI was opened. That docket was consolidated with Docket No. 160021-EI, Petition for rate increase by Florida Power & Light Company. 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. Specifically, this 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 2013-2015 approved and updated 2016-2018 wooden pole inspection programs and Ten Initiatives, and the cost of implementing the approved and updated programs and initiatives.

This Commission has jurisdiction over this matter pursuant to Sections 366.04 and 366.05, Florida Statutes (F.S.).

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<sup>6</sup>Order No. PSC-13-0637-PAA-EI, issued December 3, 2013, in Docket No: 130129-EI, In re: Petition for approval of 2013-2015 storm hardening plan, pursuant to Rule 25-6.0342, F.A.C., by Duke Energy Florida, Inc.; Order No. PSC-13-0638-PAA-EI, issued December 3, 2013, in Docket No: 130131-EI, In re: Petition for approval of 2013-2015 storm hardening plan, pursuant to Rule 25-6.0342, F.A.C., by Florida Public Utilities Company; Order No. PSC-13-0639-PAA-EI, issued December 3, 2013, in Docket No: 130132-EI, In re: Petition for approval of 2013-2015 storm hardening plan, pursuant to Rule 25-6.0342, F.A.C., by Florida Power and Light Company; Order No. PSC-13-0640-PAA-EI, issued December 3, 2013, in Docket No: 130138-EI, In re: Petition for approval of 2013-2015 storm hardening plan, pursuant to Rule 25-6.0342, F.A.C., by Tampa Electric Company; Order No. PSC-13-0641-PAA-EI, issued December 3, 2013, in Docket No: 130139-EI, In re: Petition for approval of 2013-2015 storm hardening plan, pursuant to Rule 25-6.0342, F.A.C., by Gulf Power Company.

### Decision

On Attachment B, we provided a summary of DEF's current wooden pole inspection program and Ten Initiatives and the approved changes. In addition, where available, we have shown the costs associated with the wooden pole inspection programs and Ten Initiatives for 2013-2015 and 2016-2018. Components of DEF's updated plan are summarized below.

#### **Wooden Pole Inspection Program**

DEF is continuing its eight-year wooden pole inspection.<sup>7</sup> 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 is in its second 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 2016-2018 related to the eight-year wooden pole inspection is \$9,700,000. DEF reported that it maintains approximately 800,000 wood poles in the highest decay zone. DEF plans to increase its spending on the wooden pole inspection program by approximately \$160,000 each year.

#### **Ten Initiatives**

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

DEF proposed 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.<sup>8</sup> 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 2016-2018 for Initiative One is \$104,700,000 as compared to \$100,600,000 spent in 2013-2015.

##### *Initiative Two – Audits of Joint-Use Attachment Agreements*

There is no change to this initiative. DEF will conduct an audit of all pole attachments on an eight-year cycle at a minimum.<sup>9</sup> 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, DEF 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 2016-2018 is \$1,370,000 as compared to \$1,380,000 spent in 2013-2015.

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<sup>7</sup>Order No. PSC-06-0144-PAA-EI, issued February 27, 2006, in Docket No. 060078-EI, In re: Proposal to require investor-owned electric utilities to implement ten-year wood pole inspection program.

<sup>8</sup>Order No. PSC-06-0947-PAA-EI, issued November 13, 2006, in Docket No. 060198-EI, In re: Requirement for investor-owner electric utilities to file ongoing storm preparedness plans and implementation cost estimates.

<sup>9</sup>Order No. PSC-06-0351-PAA-EI, issued April 25, 2006, in Docket No. 060198-EI, In re: Requirement for investor-owned electric utilities to file ongoing storm preparedness plans and implementation cost estimates.

*Initiative Three- Six-Year Transmission Structure Inspection Program*

DEF proposed no change 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 estimated and actual amounts for the transmission inspections include the inspections, emergency response, preventative maintenance, and training. The estimated cost for this initiative for 2016-2018 is \$68,360,000 as compared to \$62,560,000 spent in 2013-2015.

*Initiative Four – Hardening of Existing Transmission Structures*

There is no change 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. DEF reported that there is 45 percent of its transmission structures left to be hardened. The costs for 2016-2018 are estimated to be \$315,700,000 as compared to \$417,400,000 spent in 2013-2015. DEF is reporting that there will be a decrease in governmental (projects requested by the Department of Transportation), rebuild (projects which will include a complete replacement of transmission line structures, conductors, and all supporting equipment) and line (projects which replace a portion or specific equipment) projects for the next three years.

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

This initiative has no changes. DEF implemented its new GIS in 2008. The new GIS database is an asset-based GIS instead of a location-based GIS. DEF's Facilities Management Data Repository and Compliance Tracking System facilitate the compliance tracking, maintenance, planning, and risk management of the major distribution 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. The estimated costs for 2016-2018 are \$810,000, which is the same that was spent in 2013-2015.

*Initiative Six – Post-Storm Data Collection and Forensic Analysis*

DEF proposed no change 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.

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

There is no change 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, 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 and transmission systems are in the GIS.

*Initiative Eight – Increased Coordination with Local Governments*

No change was proposed for this initiative. DEF's storm planning and response program is operational year-round with approximately 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 Emergency Operating Centers (EOCs) to review storm procedures and participate in several different storm drills. DEF will also continue to hold forums for commercial, industrial, and governmental customers and "Live Line" demonstration sessions across its service territory.

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

There is no change for this initiative. DEF will continue to participate in the collaborative research effort with the other Florida's 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 has signed an extension of the memorandum of understanding with PURC, which extends the research through December 31, 2018. In addition to DEF's involvement with PURC, DEF actively engages as both participant and presenter with different organizations. These organization, such as, Southeastern Electric Exchange, Edison Electric Institute, and Institute of Electrical and Electronics Engineers, review and assess hardening alternatives.

*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.

## **National Electric Safety Code Compliance (NESC)**

All standards, practices, policies, and procedures in DEF's manuals and plan are designed to meet or exceed the requirements of the NESC. These standards, practices, policies, and procedures are followed on all new construction and all rebuilding and relocations of existing facilities.

### **Extreme Wind Loading (EWL) Standards**

DEF explained that it has extensive experience with Grade C and Grade B construction standards as defined by the NESC, properly constructed and maintained distribution lines meeting all provisions of the NESC perform satisfactorily and provide a prudent and responsible balance between cost and performance. DEF reports that its design standards can be summarized as:

- 1) Quality construction in adherence with the current NESC requirements,
- 2) Well defined and consistently executed maintenance plan, and
- 3) Prudent end-of-life equipment replacement programs.

#### *New Construction*

DEF reported that all new transmission poles are constructed with either steel or concrete pole material. Since virtually all transmission structures exceed a height of 60 feet above ground, they are constructed using the NESC EWL criteria. DEF explained that it has not adopted EWL standards for all new distribution construction because of the following:

- 1) Section 250C of the 2012 version of the NESC does not call for EWL standard for distribution poles under 60 feet. DEF's distribution poles are less than 60 feet.
- 2) All credible research, which includes studies by the NESC rules committee, demonstrates that applying EWL standards would not benefit distribution poles.
- 3) Utility experience from around the country further indicates that trees, tree limbs, and other flying debris damage electrical distribution structures less than 60 feet. DEF reported that applying the EWL standards to distribution poles would result in large increases in cost and design complexity without a commensurate benefit.
- 4) DEF reported that its experience found that vegetation and flying debris were the main causes of distribution pole damage. DEF believes the EWL standard will not address this condition. DEF further stated that in 2004, 96 percent of DEF's pole failures were attributable to flying debris and/or super extreme wind events such as tornadoes and microbursts.

We note that while Rule 25-6.0342, F.A.C., requires that a utility's plan address the extent to which EWL standards are adopted for various types of facilities, it does not require a utility to adopt a particular standard.



### *Major Planned Work*

Consistent with the NESC, DEF uses the EWL for all major planned transmission work, which includes expansions, rebuilds, and relocations of existing facilities. DEF has not adopted the EWL standard for major planned distribution work, as discussed above.

### *Critical Infrastructure (CIF)*

CIF are circuits feeding loads to critical community facilities such as hospitals, emergency shelters, master pumping stations, wastewater plants, major communications facilities, electric and gas utilities, EOCs, and police and fire stations. DEF's transmission facilities are constructed to the EWL standards irrespective of whether it can be classified as "critical" or "major." As discussed above, DEF's distribution facilities are not constructed to the EWL standards. DEF is using its prioritization model for implementation of EWL projects in selected locations throughout the service territory. Projects are submitted for possible construction on an annual basis for implementation of DEF's prioritization model. DEF has constructed several pilot projects using EWL standards since 2007. However, to date, DEF reported there has not been a significant weather event that allowed the Utility to assess the performance of these projects. DEF will continue to study the performance of the EWL standards at the various sites when a weather event allows for such analysis.

### **Mitigation of Flooding and Storm Surge Damage**

In areas where underground equipment may be exposed to storm surge and/or flooding, DEF utilizes its prioritization model. The model identifies areas where certain projects will be put into place to test whether flood mitigation techniques and devices can be used to protect the equipment. One area where DEF has employed its submersible underground strategy is St. George Island in Franklin County. DEF retrofitted its existing facilities using the submersible standards of stainless steel equipment, submersible connectors, raised mounting boxes, cold shrink sealing tubes, and submersible secondary blocks. However, there have not been any weather events of significant enough scale to test the equipment on St. George Island. DEF will continue to monitor this installation to collect and analyze data to determine how the equipment performs with respect to outage prevention, reduced maintenance, and reduced restoration times. In addition, during major storm events, DEF will place sandbags in strategic areas around substations that are in forecasted flood zones. In the event that water intrusion causes extensive damage requiring prolonged repairs, DEF will employ mobile substations to affected areas in order to restore power.

### **Facility Placement**

DEF reported that it will continue to use frontlot 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 (DCI) 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. The prioritization model is set up to analyze the following hardening alternatives for DEF:

- Overhead to underground conversions
- Small wire upgrade
- Backlot to frontlot conversion
- Submersible underground facilities
- Alternative NESC construction standards
- Feeder ties

The prioritization model compiles a list of desired projects and is evaluated based on the following criteria:

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

The prioritization model is based on a structured methodology for evaluating the benefits associated with various hardening options. DEF reported that it is using its prioritization model to ensure a systematic and analytical approach to deploying storm hardening options within the service territory.

### *Facilities Affected, Including Specifications and Standards/ Areas of Infrastructure Improvements*

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 frontlot construction for all new distribution lines were possible). As a result, all areas of DEF's service territory are impacted by its storm hardening efforts. Below is a brief list of the distribution projects.

- Saint Petersburg – one feeder tie project
- Highlands – three feeder tie projects

- Buena Vista – one feeder tie project
- Lake Wales – one feeder tie project, one small wire upgrade project
- Clermont – one small wire upgrade project
- Winter Garden – two feeder tie projects
- Longwood – one overhead to underground conversion project
- Jamestown – one small wire upgrade project
- Apopka – two feeder tie projects
- Deland – one feeder tie project
- Monticello – two feeder tie projects, one alternative NESC construction standards (EWL) project
- Ocala – two feeder tie projects, one alternative NESC construction standards (EWL), five small wire upgrade projects
- Inverness – one feeder tie project
- Clearwater – two small wire upgrades, one submersible underground facilities project

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 4, 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 72 new, rebuilds or relocation projects for its transmission system. The projects are planned over the three-year period 2016 through 2018. For the South Florida area, DEF listed 48 transmission projects for the same time period.

#### *Joint-Use Facilities*

DEF provided information to third parties who would be affected by the storm hardening projects. DEF notifies the third parties at the time of the pole change out that transfers are needed. DEF completed its joint use attachment audit in 2013 and is currently in the third year of the second round of wooden pole inspections.

*Utility Cost/Benefit Estimates*

DEF's updated plan includes estimates of costs to be incurred in connection with its updated plan for 2016 through 2018. This includes pole replacements, inspections of distribution and transmission facilities, vegetation management, and other projects. For 2013 through 2015, DEF spent a total of \$610,730,000 on its storm hardening plan. DEF estimated it will spend approximately \$520,440,000 for 2016 through 2018. DEF proposed a decrease in transmission facilities hardening projects, small wire upgrade feeder projects, backlot to frontlot conversion feeder projects, and overhead to underground conversation feeder projects in next three years. DEF has not quantified the benefits of storm hardening due to a lack of forensic data. As more projects are completed, the incremental benefits will likely be reduced. Therefore, DEF shall consider the rate impact before taking proactive steps to improve its system to withstand severe weather events. Attachment B shows a comparison of cost associated with implementation of DEF's current and updated wooden pole inspection program and Ten Initiatives.

*Attachers Cost/Benefit Estimates*

DEF believes that any entity jointly attached to its equipment would benefit, as DEF would, from the proposed storm hardening projects. DEF provided available cost/benefit information to the third party attachers.

**Attachment Standards and Procedures**

DEF's updated plan includes Joint Use Pole Guidelines addressing its joint use process, construction standards, timelines, financial responsibilities, and key company contacts responsible for the completing permit requests. DEF reported 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. Additionally, DEF performs annual and full-system audits on joint use attachments.

**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 this Commission's Rule and Orders and it shall, therefore, be approved. This Commission notes that approval of DEF's plan does not mean approval for cost recovery. DEF shall 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 updated 2016-2018 Storm Hardening Plan is hereby approved. It is further

ORDERED that the findings set forth in the body of this Order are 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 if no person whose substantial interests are affected by the proposed agency action files a protest within 21 days of the issuance of this Order, this docket shall be closed upon the issuance of the consummating order.

By ORDER of the Florida Public Service Commission this 19th day of December, 2016.



CARLOTTA S. STAUFFER

Commission Clerk

Florida Public Service Commission

2540 Shumard Oak Boulevard

Tallahassee, Florida 32399

(850) 413-6770

[www.floridapsc.com](http://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.

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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 January 9, 2017.

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.

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| <b>Storm Hardening Requirements: Wooden Pole Inspection Program &amp; Ten Initiatives</b> |
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| <b>Eight-Year Wooden Pole Inspection Program</b> |
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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.   |

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| <b>Initiative 1 – A Three-Year Vegetation Management Cycle for Distribution Circuits</b> |
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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.  |

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| <b>Initiative 2 – Audit of Joint-Use Attachment Agreements</b> |
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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.   |

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| <b>Initiative 3 – Six-Year Transmission Inspection Program</b> |
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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.  |

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| <b>Initiative 4 – Hardening of Existing Transmission Structures</b> |
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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.   |

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| <b>Initiative 5 – Transmission and Distribution Geographic Information System</b>  |
| 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.  |
| <b>Initiative 6 – Post-Storm Data Collection and Forensic Analysis</b>   |
| 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.  |
| <b>Initiative 7 – Collection of Detailed Outage Data Differentiating between the Reliability Performance of Overhead and Underground Systems</b>   |
| 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.  |
| <b>Initiative 8 – Increased Coordination with Local Governments</b>  |
| 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.   |
| <b>Initiative 9 – Collaborative Research</b>   |
| 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.  |
| <b>Initiative 10 – A Natural Disaster Preparedness and Recovery Program</b>  |
| 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.   |



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| <b>Duke Energy Florida, LLC</b> |
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| <b>Eight-Year Wooden Pole Inspection Program</b>                                |   |
| <b>Current Plan</b>   | <b>Updated Plan</b>                                     |
| 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 2013-2015 were \$7,380,000.  | 3. Costs for 2016-2018 are estimated to be \$9,700,000. |

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| <b>Initiative 1 – A Three-Year Vegetation Management Cycle for Distribution Circuits</b>                     |   |
| <b>Current Plan</b>  | <b>Updated Plan</b>                                       |
| 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 2013-2015 were \$100,600,000.   | 3. Costs for 2016-2018 are estimated to be \$104,700,000. |

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| <b>Initiative 2 – Audit of Joint-Use Attachment Agreements</b>                                   |   |
| <b>Current Plan</b>  | <b>Updated Plan</b>                                     |
| 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 2013-2015 were \$1,380,000   | 5. Costs for 2016-2018 are estimated to be \$1,370,000. |

| <b>Initiative 3 – Six-Year transmission Inspection Program</b>   |  |
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| Current Plan   | Updated Plan   |
| 1. Inspection program is multi-pronged approach with inspection cycles of one, six, 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 2013-2015 were \$62,560,000.  | 3. Costs for 2016-2018 are estimated to be \$68,360,000. |

| <b>Initiative 4 – Hardening of Existing Transmission Structures</b>  |   |
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| 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 2013-2015 were \$417,400,000.   | 3. Costs for 2016-2018 are estimated to be \$315,700,000. |

| <b>Initiative 5 – Transmission and Distribution Geographic Information System</b> |   |
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| 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  |
| 6. Costs for 2013-2015 were \$810,000.  | 6. Costs for 2016-2018 are estimated to be \$810,000. |

| <b>Initiative 6 – Post-Storm Data Collection and Forensic Analysis</b>   |              |
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| 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 |

| <b>Initiative 7 – Collection of Detailed Outage Data Differentiating between the Reliability Performance of Overhead and Underground Systems</b> |              |
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| 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 |

| <b>Initiative 8 – Increased Coordination with Local Governments</b>  |   |
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| 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                                    |
| 2. Costs for 2013-2015 were \$0.   | 2. Costs for 2016-2018 are estimated to be \$0. |

| <b>Initiative 9 – Collaborative Research</b>  |  |
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| 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. |
| 5. Costs for 2013-2015 were \$0   | 5. Costs for 2016-2018 are estimated to be \$0.  |

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