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May 12, 2020

*VIA ELECTRONIC FILING*

Mr. Adam Teitzman  
Division of the Commission Clerk and Administrative Services  
Florida Public Service Commission  
2540 Shumard Oak Blvd.  
Tallahassee, FL 32399-0850

**Re: Docket No. 20200071-EI**  
**Correction to Florida Power & Light Company’s 2020-2029 Storm Protection**  
**Plan (Exhibit MJ-1)**

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Dear Mr. Teitzman:

Enclosed for filing on behalf of Florida Power & Light Company (“FPL”) are the following documents correcting an inadvertent error in FPL’s 2020-2029 Storm Protection Plan, which is Exhibit MJ-1 to the Direct Testimony of FPL witness Michael Jarro in Docket No. 20200071:

- Errata Sheet of FPL witness Michael Jarro, correcting Exhibit MJ-1, pages 46 and 47
- Exhibit MJ-1, pages 46 and 47 in legislative format
- Exhibit MJ-1, pages 46 and 47 in clean format
- A complete copy of the Corrected Exhibit MJ-1 in clean format

These corrections are necessary due to an inadvertent error discovered by FPL. Subsequent to filing its 2020-2029 Storm Protection Plan on April 10, 2020, FPL re-reviewed its filing and supporting workpapers and identified an inadvertent error in the calculation of the estimated revenue requirements reflected on page 46 of Exhibit MJ-1. As a result of this review, FPL updated the calculation of its revenue requirements to remove duplicate laterals that were inadvertently included in the beginning Construction Work in Progress (CWIP) balances. The net effect is a decrease of approximately \$0.3 million in revenue requirements for each period reflected on page 46 of Exhibit MJ-1. The updated calculation of the annual revenue requirements also resulted in the hypothetical rate impacts for the 2020 Residential (RS-1) rate reflected in footnote 36 on page 47 of Exhibit MJ-1 to decrease from \$0.00251/kWh to \$0.00250/kWh. These corrections are reflected in the above-referenced documents.

FPL notified the Parties and Staff about the correction in a discovery response served on April 27, 2020.

Copies of this filing will be provided as indicated on the enclosed Certificate of Service. If you or your staff have any questions regarding this filing, please contact me at (561) 691-7144.

Respectfully submitted,

*s/Christopher Wright*

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Christopher T. Wright

Authorized House Counsel No. 1007055

Enclosure

**BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION**

In re: Review of 2020-2029 Storm Protection Plan pursuant to Rule 25-6.030, F.A.C., Florida Power & Light Company

Docket No. 20200071-EI

Filed: May 12, 2020

**ERRATA SHEET OF MICHAEL JARRO**

**April 10, 2020 –Direct Testimony**

**EXHIBIT #      PAGE #      CHANGE**

MJ-1                      46 of 48                      The table in Section VI – Estimate of Annual Jurisdictional Revenue Requirements for the 2020-2029 SPP:

**Estimated Annual Revenue Requirements (millions)**

Year of SPP	Delete	Insert
2020	\$257.6	\$257.3
2021	\$369.1	\$368.8
2022	\$494.3	\$494.0
2023	\$625.5	\$625.2
2024	\$760.9	\$760.6
2025	\$878.1	\$877.9
2026	\$963.7	\$963.4
2027	\$1,037.1	\$1,036.8
2028	\$1,110.9	\$1,110.7
2029	\$1,185.2	\$1,185.0

MJ-1                      47 of 48                      Footnote 36 – 2020 Residential (RS-1) rate:  
Delete “\$0.00251/kWh” and insert “\$0.00250/kWh”

The above-described corrections are reflected in the following attached documents:

- Exhibit MJ-1, pages 46 and 47 in legislative format
- Exhibit MJ-1, pages 46 and 47 in clean format
- A complete copy of the Corrected Exhibit MJ-1 in clean format

**Exhibit MJ-1, pages 46 and 47  
(legislative format)**

## **VI. Estimate of Annual Jurisdictional Revenue Requirements for the 2020-2029 SPP**

Pursuant to Rule 25-6.030(3)(f), F.A.C., the table below provides the estimated annual jurisdictional revenue requirements for each year of the SPP.

**Estimated Annual Revenue Requirements (millions)**

2020	<del>\$257.6</del> <u>\$257.3</u>
2021	<del>\$369.4</del> <u>\$368.8</u>
2022	<del>\$494.3</del> <u>\$494.0</u>
2023	<del>\$625.5</del> <u>\$625.2</u>
2024	<del>\$760.9</del> <u>\$760.6</u>
2025	<del>\$878.1</del> <u>\$877.9</u>
2026	<del>\$963.7</del> <u>\$963.4</u>
2027	<del>\$1,037.1</del> <u>\$1,036.8</u>
2028	<del>\$1,110.9</del> <u>\$1,110.7</u>
2029	<del>\$1,185.2</del> <u>\$1,185.0</u>

While FPL has provided estimated costs by program as of the time of this filing and associated total revenue requirements in its SPP, consistent with the requirements of Rule 25-6.030, F.A.C., subsequent projected and actual program costs submitted for cost recovery through the Storm Protection Plan Cost Recovery Clause (per Rule 25-6.031, F.A.C.,) could vary by as much as 10-15%, which would then also impact associated estimated revenue requirements and rate impacts. The projected costs, actual/ estimated costs, actuals costs, and true-up of actual costs to be included in FPL's Storm Protection

Plan Cost Recovery Clause will all be addressed in subsequent filings in separate storm protection plan cost recovery clause dockets pursuant to Rule 25-6.031, F.A.C.<sup>35</sup>

## **VII. Estimated Rate Impacts for First Three Years of the SPP (2020-2022)**

FPL anticipates the programs included in the SPP will have zero bill impacts on customer bills during the first year of the SPP and only minimal bill increases for years two and three of the SPP. An estimate of hypothetical overall rate impacts for the first three years of the SPP (2020-2022), without regard for the fact that FPL remains under a general base rate freeze pursuant to a Commission-approved settlement agreement through December 31, 2021, as stated in footnote 36 below are based on the total program costs reflected in this filing.<sup>36</sup> The projected costs, actual/estimated costs, actuals costs, and true-up of actual costs to be included in FPL's Storm Protection Plan Cost Recovery Clause will all be addressed in subsequent filings in Storm Protection Plan Cost Recovery Clause dockets pursuant to Rule 25-6.031, F.A.C.<sup>37</sup>

Pursuant to Rule 25-6.031, F.A.C., FPL has not identified any reasonable implementation alternatives that could mitigate the resulting rate impact for each of the first three years of the SPP. As explained above, FPL's SPP is largely a continuation of existing Commission-approved storm hardening programs and initiatives, which have already demonstrated that they have and will continue to provide increased T&D infrastructure resiliency, reduced restoration time, and reduced restoration costs when FPL's system is impacted by severe weather events. Further, as explained above, the estimated costs

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<sup>35</sup> The Commission has opened Docket No. 20200092-EI to address Storm Protection Plan Cost Recovery Clause petitions to be filed the third quarter of 2020.

<sup>36</sup> Pursuant to Rule 25-6.030(3)(h), F.A.C., the hypothetical rate impacts for FPL's typical residential, commercial, and industrial customers for the first three years of the SPP (2020-2022) without regard for the fact that FPL remains under a general base rate freeze pursuant to a Commission-approved settlement agreement through December 31, 2021, are as follows for 2020, 2021, and 2022, respectively: Residential (RS-1) ~~\$0.00250/kWh~~ ~~\$0.00251/kWh~~, \$0.00357/kWh, and \$0.00478/kWh; Commercial (GSD-1) \$0.81/kW, \$1.15/kW, and \$1.54/kW; and Industrial (GSLDT-3) \$0.05/kW, \$0.08/kW and \$0.10/kW. These rate impacts are for all programs included in the SPP and are based on the total estimated costs as of the time of this filing, which could vary by as much as 10% to 15%, regardless of whether those costs will be recovered in FPL's Storm Protection Plan Cost Recovery Clause or through base rates.

<sup>37</sup> See footnote 34.

**Exhibit MJ-1, pages 46 and 47  
(clean format)**

## **VI. Estimate of Annual Jurisdictional Revenue Requirements for the 2020-2029 SPP**

Pursuant to Rule 25-6.030(3)(f), F.A.C., the table below provides the estimated annual jurisdictional revenue requirements for each year of the SPP.

<b>Estimated Annual Revenue Requirements (millions)</b>	
2020	\$257.3
2021	\$368.8
2022	\$494.0
2023	\$625.2
2024	\$760.6
2025	\$877.9
2026	\$963.4
2027	\$1,036.8
2028	\$1,110.7
2029	\$1,185.0

While FPL has provided estimated costs by program as of the time of this filing and associated total revenue requirements in its SPP, consistent with the requirements of Rule 25-6.030, F.A.C., subsequent projected and actual program costs submitted for cost recovery through the Storm Protection Plan Cost Recovery Clause (per Rule 25-6.031, F.A.C.,) could vary by as much as 10-15%, which would then also impact associated estimated revenue requirements and rate impacts. The projected costs, actual/ estimated costs, actuals costs, and true-up of actual costs to be included in FPL's Storm Protection



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Pursuant to Rule 25-6.031, F.A.C., FPL has not identified any reasonable implementation alternatives that could mitigate the resulting rate impact for each of the first three years of the SPP. As explained above, FPL's SPP is largely a continuation of existing Commission-approved storm hardening programs and initiatives, which have already demonstrated that they have and will continue to provide increased T&D infrastructure resiliency, reduced restoration time, and reduced restoration costs when FPL's system is impacted by severe weather events. Further, as explained above, the estimated costs

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<sup>35</sup> The Commission has opened Docket No. 20200092-EI to address Storm Protection Plan Cost Recovery Clause petitions to be filed the third quarter of 2020.

<sup>36</sup> Pursuant to Rule 25-6.030(3)(h), F.A.C., the hypothetical rate impacts for FPL's typical residential, commercial, and industrial customers for the first three years of the SPP (2020-2022) without regard for the fact that FPL remains under a general base rate freeze pursuant to a Commission-approved settlement agreement through December 31, 2021, are as follows for 2020, 2021, and 2022, respectively: Residential (RS-1) \$0.00250/kWh, \$0.00357/kWh, and \$0.00478/kWh; Commercial (GSD-1) \$0.81/kW, \$1.15/kW, and \$1.54/kW; and Industrial (GSLDT-3) \$0.05/kW, \$0.08/kW and \$0.10/kW. These rate impacts are for all programs included in the SPP and are based on the total estimated costs as of the time of this filing, which could vary by as much as 10% to 15%, regardless of whether those costs will be recovered in FPL's Storm Protection Plan Cost Recovery Clause or through base rates.

<sup>37</sup> See footnote 34.

**Complete Copy of the Corrected Exhibit MJ-1  
(clean format)**

# **Florida Power & Light Company**

## **Storm Protection Plan**

**2020-2029**

**(Rule 25-6.030, F.A.C.)**

**Docket No. 20200071-EI**

**April 10, 2020**

## TABLE OF CONTENTS

I.	Executive Summary.....	1
II.	The 2020-2029 SPP will Strengthen FPL’s Infrastructure to Withstand Extreme Weather Conditions and will Reduce Restoration Costs and Outage Times.....	3
III.	Description of Service Area and T&D Facilities .....	6
IV.	2020-2029 SPP Programs.....	7
A.	Pole Inspections – Distribution Program .....	7
1.	Description of the Program and Benefits.....	7
2.	Actual/Estimated Start and Completion Dates .....	10
3.	Cost Estimates .....	10
4.	Comparison of Costs and Benefits.....	11
5.	Criteria used to Select and Prioritize the Program .....	11
B.	Structures/Other Equipment Inspections – Transmission Program .....	12
1.	Description of the Program and Benefits.....	12
2.	Actual/Estimated Start and Completion Dates .....	14
3.	Cost Estimates .....	14
4.	Comparison of Costs and Benefits.....	15
5.	Criteria used to Select and Prioritize the Program .....	15
C.	Feeder Hardening (EWL) – Distribution Program .....	16
1.	Description of the Program and Benefits.....	16
2.	Actual/Estimated Start and Completion Dates .....	20
3.	Cost Estimates .....	21
4.	Comparison of Costs and Benefits.....	21
5.	Criteria used to Select and Prioritize the Program .....	21
D.	Lateral Hardening (Undergrounding) – Distribution Program.....	22
1.	Description of the Program and Benefits.....	22
2.	Actual/Estimated Start and Completion Dates .....	25
3.	Cost Estimates .....	25
4.	Comparison of Costs and Benefits.....	25
5.	Criteria used to Select and Prioritize the Program .....	26

- E. Wood Structures Hardening (Replacing) – Transmission Program ..... 26
  - 1. Description of the Program and Benefits..... 26
  - 2. Actual/Estimated Start and Completion Dates ..... 28
  - 3. Cost Estimates ..... 28
  - 4. Comparison of Costs and Benefits..... 29
  - 5. Criteria used to Select and Prioritize the Program ..... 29
- F. Substation Storm Surge/Flood Mitigation Program ..... 30
  - 1. Description of the Program and Benefits..... 30
  - 2. Actual/Estimated Start and Completion Dates ..... 31
  - 3. Cost Estimates ..... 31
  - 4. Comparison of Costs and Benefits..... 31
  - 5. Criteria used to Select and Prioritize Projects ..... 32
- G. Vegetation Management – Distribution Program ..... 32
  - 1. Description of the Program and Benefits..... 32
  - 2. Actual/Estimated Start and Completion Dates ..... 35
  - 3. Cost Estimates ..... 35
  - 4. Comparison of Costs and Benefits..... 36
  - 5. Criteria Used to Select and Prioritize the Program..... 36
- H. Vegetation Management – Transmission Program ..... 37
  - 1. Description of the Program and Benefits..... 37
  - 2. Actual/Estimated Start and Completion Dates ..... 39
  - 3. Cost Estimates ..... 39
  - 4. Comparison of Costs and Benefits..... 40
  - 5. Criteria used to Select and Prioritize the Programs..... 40
- V. Detailed Information on the First Three Years of the SPP (2020-2022) ..... 41
  - A. Detailed Description for the First Year of the SPP (2020)..... 41
  - B. Detailed Description of the Second and Third Years of the SPP (2021-2022) ..... 41
  - C. Detailed Description of the Vegetation Management Activities for the First Three Years of the SPP (2020-2022) ..... 41
- VI. Estimate of Annual Jurisdictional Revenue Requirements for the 2020-2029 SPP ..... 42

VII. Estimated Rate Impacts for First Three Years of the SPP (2020-2022) ..... 43

VIII. Conclusion..... 44

Appendices:

- Appendix A – FPL’s Third Supplemental Response to Staff’s First Data Request No. 29 (“Third Supplemental Amended”) in Docket No. 20170215-EI
- Appendix B – FPL Management Areas and Customers Served
- Appendix C – FPL 2020-2029 SPP Estimated Annual Costs and Estimated Number and Costs of Projects
- Appendix D – FPL Distribution Design Guidelines
- Appendix E – Project Level Detail for First Year of the SPP (2020)

# **Florida Power & Light Company 2020-2029 Storm Protection Plan**

## **I. Executive Summary**

Pursuant to Section 366.96, Florida Statutes (“F.S.”), and Rule 25-6.030, Florida Administrative Code (“F.A.C.”), Florida Power & Light Company (“FPL”) submits its Storm Protection Plan for the ten (10) year period 2020-2029 (hereinafter, the “SPP”). As explained herein, the SPP is largely a continuation of FPL’s successful storm hardening and storm preparedness programs previously approved by the Florida Public Service Commission (“Commission”) over the last fourteen years. FPL anticipates the programs included in the SPP will have zero bill impacts on customer bills during the first year of the SPP and only minimal bill increases for years two and three of the SPP.<sup>1</sup>

Since 2006, FPL has been implementing Commission-approved programs to strengthen its transmission and distribution (“T&D”) infrastructure. These programs include multiple storm hardening and storm preparedness programs, such as feeder hardening, replacing wood transmission structures, vegetation management, and pole inspections. As demonstrated by recent storm events, these ongoing storm hardening and storm preparedness programs have resulted in FPL’s T&D electrical grid becoming more storm resilient, experiencing less infrastructure damage and reduced restoration times, as compared to non-hardened facilities. These programs have also provided significant improvements in day-to-day reliability.

The success of FPL’s storm hardening and storm preparedness programs has been achieved through the development and implementation of FPL’s forward-looking storm hardening, grid modernization, and reliability initiatives and investments, combined with the use of cutting-edge technology and strong employee commitment. Under the SPP, FPL remains committed to continue these successful and industry-leading programs to

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<sup>1</sup> The recovery of the costs associated with the SPP, as well as the actual and projected costs to be included in FPL’s Storm Protection Plan Cost Recovery Clause, will be addressed in a subsequent and separate Storm Protection Plan Cost Recovery Clause docket pursuant to Rule 25-6.031, F.A.C.

further strengthen its T&D infrastructure, mitigate restoration costs and outage times, continue to provide safe and reliable electric service to customers, and meet future increasing needs and expectations.

As stated previously, FPL's SPP is, in large part, a continuation and expansion of its previously approved storm hardening and storm preparedness programs, and includes the following SPP programs:

- Pole Inspections – Distribution Program
- Structures/Other Equipment Inspections – Transmission Program
- Feeder Hardening (EWL) – Distribution Program
- Lateral Hardening (Undergrounding) – Distribution Program
- Wood Structures Hardening (Replacing) – Transmission Program
- Vegetation Management – Distribution Program
- Vegetation Management – Transmission Program

In addition, FPL will implement a new Substation Storm Surge/Flood Mitigation Program to harden certain targeted substations that, based on prior experience, are susceptible to storm surge or flooding during extreme weather events.

With the exception of the new storm surge/flood mitigation program, the majority of the programs included in the SPP have been in place since 2007. As demonstrated by recent storm events, these programs have been successful in reducing restoration costs and outage times following major storms, as well as improving day-to-day reliability. FPL submits that continuing these previously approved storm hardening and storm preparedness programs in the SPP, together with the new storm surge/flood mitigation substation program, is appropriate and necessary to address the mandates set forth in Section 366.96, F.S., and Rule 25-6.030, F.A.C., as well as the expectations of FPL's customers and other stakeholders for increased storm resiliency and will result in fewer



outages, reduced restoration costs, and prompt service restoration.<sup>2</sup> The SPP will continue and expand the benefits of hardening, including improved day-to-day reliability, to all customers throughout FPL's system.

The following sections provide information and details on FPL's SPP as required by and in compliance with Rule 25-6.030, F.A.C. For the reasons explained below, FPL submits that implementing the SPP is necessary and appropriate to achieve the goals and requirements expressed by the Florida Legislature in Section 366.96, F.S., to reduce restoration costs and outage times associated with extreme weather events and improve overall service reliability to customers and the State of Florida by promoting the overhead hardening of electrical transmission and distribution facilities, the undergrounding of certain electrical distribution lines, and vegetation management.

## **II. The 2020-2029 SPP will Strengthen FPL's Infrastructure to Withstand Extreme Weather Conditions and will Reduce Restoration Costs and Outage Times**

Pursuant to Rule 25-6.030(3)(a), F.A.C., this section provides an overview of how the SPP will strengthen FPL's electric utility infrastructure to withstand extreme weather conditions by promoting the overhead hardening of electrical transmission and distribution facilities, the undergrounding of certain electrical distribution lines, and vegetation management. Consistent with Rule 25-6.030(3)(b), F.A.C., this section also provides a summary of how the SPP is expected to further reduce restoration costs and outage times associated with extreme weather conditions and, therefore, improve overall service reliability.

To date, significant progress has been made toward strengthening FPL's infrastructure. For example, at year-end 2019, approximately 54% of FPL's distribution feeders have been either hardened or placed underground, and approximately 96% of FPL's transmission structures are either steel or concrete. Also, since 2006, FPL has completed multiple system-wide cycles of distribution and transmission pole inspections and

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<sup>2</sup> As explained below, a couple of the programs included in the SPP are expected to be completed within the next several years.

vegetation management. Within the next few years several significant milestones are also expected to be reached, including replacement of all wood transmission structures with steel or concrete structures by year-end 2022 and for all feeders to be hardened or placed underground by year-end 2024.

FPL also implemented a three-year Storm Secure Underground Program Pilot in 2018 (“SSUP Pilot”) that converts certain targeted overhead laterals – laterals that have been impacted by recent storms and have a history of vegetation-related outages and other reliability issues – to underground laterals. At year-end 2020, the final year of the SSUP Pilot, FPL expects 220-230 of these targeted laterals to be converted from overhead to underground. In addition, FPL’s Design Guidelines incorporate and apply extreme wind loading (“EWL”) criteria to the design and construction of all new overhead pole lines and major planned work, including pole line extensions, relocations, and certain pole replacements.

FPL’s SPP programs have already demonstrated that they have and will continue to provide increased T&D infrastructure resiliency, reduced restoration time, and reduced restoration costs when FPL’s system is impacted by severe weather events. In FPL’s Third Supplemental Response to Staff’s First Data Request No. 29 (“Third Supplemental Amended”) in Docket No. 20170215-EI,<sup>3</sup> FPL prepared and submitted an analysis of Hurricanes Matthew and Irma that indicated the restoration construction man-hours (“CMH”), days to restore, and storm restoration costs for these storms would have been significantly higher without FPL’s storm hardening programs. Below is a summary of the results of FPL’s analysis:

<b>Without Hardening</b>	<b>Hurricane Matthew</b>	<b>Hurricane Irma</b>
Additional CMH (%)	93,000 (36%)	483,000 (40%)
Additional days to restore (%)	2 (50%)	4 (40%)
Additional restoration costs (\$millions) (%)	\$105 (36%)	\$496 (40%)

<sup>3</sup> The Commission opened Docket No. 20170215-EI to review electric utility preparedness and restoration actions and to identify potential areas where infrastructure damage, outages, and recovery time for customers could be minimized in the future.

A copy of FPL's Third Supplemental Amended Response in Docket No. 20170215-EI, including the analysis referenced above, is provided in Appendix A. Based on a 40-year net present value analysis, the savings achieved from storm hardening would equate to \$653 million (for a storm occurring once every three years) and \$406 million (for a storm occurring once every five years) for a storm similar to Hurricane Matthew and \$3.1 billion (for a storm occurring once every three years) and \$1.9 billion (for a storm occurring once every five years) for a storm similar to Hurricane Irma.

These programs have also provided increased levels of day-to-day reliability. For example, FPL has previously submitted reports to the Commission that show hardened feeders have performed approximately 40% better (*i.e.*, fewer outages) on a day-to-day basis than non-hardened feeders.<sup>4</sup> Further details on the benefits of the SPP programs are provided throughout the remaining sections of this SPP.

Although FPL's storm preparedness and hardening programs to date have produced a more storm resilient and reliable T&D electrical grid, FPL must continue its efforts to storm-harden its T&D electrical grid consistent with the findings, conclusions, and objectives of the Florida Legislature in Section 366.96, F.S. Indeed, Florida remains the most hurricane-prone state in the nation and, with the significant coast-line exposure of FPL's system and the fact that the vast majority of FPL's customers live within 20 miles of the coast, a robust storm protection plan is critical to maintaining and improving grid resiliency and storm restoration.

Safe and reliable electric service is essential to the life, health, and safety of the public, and has become a critical component of modern life. Importantly, as evidenced by the significant numbers of Florida's workforce that are working remotely during the COVID-19 pandemic, today's digital society, economy, national security, and daily life are more dependent on reliable electric service than ever before. While no electrical system can be made completely resistant to the impacts of hurricanes and other extreme weather conditions, the programs included in FPL's SPP have already demonstrated that they

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<sup>4</sup> See Appendix A.

mitigate and will continue to mitigate the impacts of future storms.<sup>5</sup> While FPL's nation-leading initiatives have made significant progress toward strengthening FPL's infrastructure, continuing these previously approved storm hardening and storm preparedness programs in the SPP, together with the new storm surge/flood mitigation substation program, is appropriate and crucial to further mitigate restoration costs and outage times, continue to provide safe and reliable electric service to customers, and meet current and future needs and expectations of customers, today and for many years to come.

### **III. Description of Service Area and T&D Facilities**

Pursuant to Rule 25-6.030(3)(c), F.A.C., this section provides a description of FPL's service area, including areas prioritized for enhancement, if any, and any areas where FPL has determined that enhancement of its existing T&D facilities would not be feasible, reasonable, or practical at this time.

Today, FPL's service territory consists of approximately 28,000 square miles. To serve its more than 5 million customers, FPL has constructed a T&D electric grid that contains approximately 75,000 miles of electrical lines, including:

- Approximately 42,000 miles of overhead distribution lines;
- Approximately 26,000 miles of underground distribution lines;
- Approximately 7,000 miles of high-voltage transmission lines;
- Approximately 1.2 million distribution poles; and
- Approximately 68,000 transmission structures.

FPL's service territory is divided into sixteen (16) distribution management areas. A map depicting FPL's service territory and distribution management areas (with the number of customers served within each management area) is provided in Appendix B.

At this time, FPL has not identified any areas of its service territory where its SPP programs would not be feasible, reasonable, or practical. While all of FPL's SPP

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<sup>5</sup> It is important to note that despite the implementation of these storm hardening and storm preparedness programs, outages will still occur when severe weather events impact Florida.

programs are currently system-wide initiatives, annual activities are prioritized based on certain factors such as last inspection date, last trim date, reliability performance, and efficient resource utilization.<sup>6</sup> At this time, there is no area specifically targeted or prioritized for enhanced performance based on its geographical location.

#### **IV. 2020-2029 SPP Programs**

Pursuant to Rule 25-6.030(3)(c)(d), F.A.C., this section provides a description of each program included in FPL's SPP. If applicable, each program description below includes: (1) a description of how each program is designed to enhance FPL's existing transmission and distribution facilities including an estimate of the resulting reduction in outage times and restoration costs due to extreme weather conditions; (2) identification of the actual or estimated start and completion dates of the program; (3) a cost estimate including capital and operating expenses; (4) a comparison of the costs and the benefits; and (5) a description of the criteria used to select and prioritize storm protection programs.

##### **A. Pole Inspections – Distribution Program**

###### **1. Description of the Program and Benefits**

The Pole Inspection – Distribution Program included in the SPP is a continuation of FPL's existing Commission-approved distribution pole inspection program. Below is an overview of FPL's existing distribution inspection program and its associated benefits.

###### ***a. Overview of the Distribution Pole Inspection Program***

In response to the 2004-2005 storm seasons and, in particular, the "large number of poles throughout Florida that required replacement," the Commission required investor-owned utilities ("IOUs") to implement an eight-year pole inspection cycle for all wood distribution poles.<sup>7</sup> FPL's plan was approved in September 2006<sup>8</sup> and modified in January 2007.<sup>9</sup>

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<sup>6</sup> The criteria and factors used to select and prioritize projects within each SPP program are described below.

<sup>7</sup> See Order No. PSC-06-0144-PAA-EI.

<sup>8</sup> See Order No. PSC-06-0778-PAA-EU.

<sup>9</sup> See Order No. PSC-07-0078-EU.

Subsequently, FPL expanded its distribution pole inspection plan to also include concrete poles.

FPL's eight-year pole inspection cycle for all distribution poles targets approximately 1/8 of the system annually (the actual number of poles inspected can vary somewhat from year to year). To ensure inspection coverage throughout its service territory, FPL established nine (9) inspection zones (based on FPL's management areas and pole population) and annually performs pole inspections of approximately 1/8 of the distribution poles in each of these zones, as well as any necessary remediation as a result of such inspections. FPL utilizes Osmose Utilities Services, Inc. ("Osmose"), an industry-leading pole inspection contractor, to perform the system-wide inspection of its distribution poles.

FPL's strength and loading calculations for its distribution poles and pole inspections are based on the National Electrical Safety Code's ("NESC") Grade B construction standard, as outlined by Table 261-1A section 26 of the NESC. Osmose utilizes mobile computing technology to record inspection data and to calculate strength and loading. The loading calculation, span lengths, attachment heights, and wire sizes are recorded in the mobile computer to determine whether the remaining pole strength capacity meets or exceeds NESC requirements. This data is then transferred to FPL's Geographic Information System ("GIS"). Pole locations inspected by Osmose are also randomly audited by FPL to verify that inspections are completed and meet inspection standards.

Inspections include a visual inspection of all distribution poles from the ground-line to the top of the pole to identify visual defects (e.g., woodpecker holes, split tops, decayed tops, cracks, etc.). If, due to the severity of the defects, the poles are not suitable for continued service, the poles are designated for replacement.

Wood poles that pass the above-ground visual inspection are excavated to a depth of 18" (where applicable), and sounded and bored to determine the internal condition of the pole. Poles encased in concrete or asphalt are not excavated, but are sounded and bored to determine their internal condition using a standard industry-accepted inspection process called "Shell Boring." All suitable wood poles receive external and/or internal preservative treatment or, if not suitable, are replaced. Strength calculations are also

performed on wood poles to determine compliance with NESC requirements. The poles that are not suitable for continued service are designated for replacement or remediation.

In 2014, FPL obtained Commission approval to: (1) exempt the loading assessment during the second eight-year cycle for any pole that had less than 80% of full load during FPL's initial eight-year cycle; and (2) excavate Chromium Copper Arsenate ("CCA") poles every 28 years (extended from 16 years originally approved by the Commission).<sup>10</sup> To ensure that these exceptions to the standard eight-year inspection cycle do not compromise existing safety and storm hardening programs, FPL conducts annual testing on 1% of the exempted poles.

*b. Benefits of the Distribution Pole Inspection Program*

The Commission has previously found that "efforts to maintain system components can reduce the impact of hurricanes and tropical storms upon utilities' transmission and distribution systems," and noted that an "obvious key component in electric infrastructure is the transmission and distribution poles."<sup>11</sup> The Commission has also previously identified multiple benefits of and reasons for justifying pole inspections cycles for electric utilities, including, but not limited to: the likelihood of increased hurricane activity in the future; the high probability for equipment damage if a pole fails during a storm; the likelihood that failure of one pole often causes other poles to fail; the fact that deteriorated poles are more prone to fail when exposed to high winds; the fact that Florida electric utilities replaced nearly 32,000 poles during the 2004 storm restoration efforts; and the fact that restoration times increase significantly when a large number of poles fail, which limits the electric utilities' ability to respond quickly to widespread outages.<sup>12</sup>

In addition to the benefits discussed above that underlie the creation of the Commission's mandated pole inspection requirements, recent storm events indicate that FPL's distribution pole inspection program has contributed to the overall improvement in distribution pole performance during storms, resulting in reductions in storm damage to poles, days to restore, and storm restoration costs. The table below compares distribution

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<sup>10</sup> See Order No. PSC-14-0594-PAA-EI.

<sup>11</sup> See Order No. PSC-06-0144-PAA-E.

<sup>12</sup> See *id.*

pole performance for Hurricane Wilma, which occurred in 2005 before FPL implemented its current distribution pole inspection program, and Hurricane Irma, which occurred in 2017 after FPL implemented its current distribution pole inspection program:

	<b>Hurricane Wilma</b>	<b>Hurricane Irma</b>
Hurricane Strength (Category)	3	4
Customer Outages (Millions)	3.2	4.4
Distribution Poles Replaced	>12,400	<2,900 <sup>13</sup>
Total Days to Restore	18	10
Average Days to Restore	5.4	2.1

FPL's Commission-approved distribution pole inspection program has facilitated the replacement and/or strengthening of over 140,000 distribution poles since it was first implemented in 2006 and has directly improved and will continue to improve the overall health and storm resiliency of its distribution pole population.

2. Actual/Estimated Start and Completion Dates

The SPP will continue FPL's ongoing Commission-approved distribution pole inspection program described above. With approximately 1.2 million distribution poles as of year-end 2019, FPL expects to inspect approximately 150,000 poles annually (spread throughout its nine inspection zones) during the 2020-2029 SPP period.

3. Cost Estimates

Estimated/actual annual distribution pole inspection costs are a function of the number of inspections estimated to be/actually completed and the number of poles estimated to be/actually remediated/replaced as a result of the annual inspections. Although costs to inspect the poles are operating expenses, the vast majority of pole inspection program costs are capital costs resulting from remediation/replacement of poles that fail inspection.

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<sup>13</sup> Approximately 99% of distribution poles replaced after Hurricane Irma were non-hardened poles.



The table below provides a comparison of the 2017-2019 total actual distribution pole inspection costs with the 2020-2022 (first three years of the SPP) total estimated distribution pole inspection costs and the 2020-2029 total estimated distribution pole inspection costs:

	<b>Total Program Costs (millions)</b>	<b>Annual Average Program Costs (millions)</b>
2017-2019	\$152	\$51
2020-2022	\$170	\$57
2020-2029	\$605	\$61

Further details regarding SPP estimated distribution pole inspection costs, including estimated annual capital expenditures and operating expenses, are provided in Appendix C.<sup>14</sup>

4. Comparison of Costs and Benefits

As provided in Section (IV)(A)(3) above, during 2020-2029, total costs for FPL’s Pole Inspection – Distribution Program are expected to average approximately \$61 million per year. Benefits associated with FPL’s Pole Inspection – Distribution Program, discussed in Sections II and IV(A)(1)(b) above, include a more storm resilient pole population that will result in reductions in pole failures and poles needing to be replaced during storms, fewer storm-related outages and reductions in storm restoration costs.

5. Criteria used to Select and Prioritize the Program

Poles to be inspected annually are selected/prioritized within each of the nine (9) inspection zones established throughout FPL’s service territory based on the last cycle’s inspection dates, to ensure that poles are in compliance with FPL’s established eight-year

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<sup>14</sup> Note, the 2020-2029 program costs shown above are projected costs estimated as of the time of this filing. Subsequent projected and actual costs could vary by as much as 10% to 15%. The annual projected costs, actual/estimated costs, actuals costs, and true-up of actual costs to be included in FPL’s Storm Protection Plan Cost Recovery Clause will all be addressed in subsequent and separate Storm Protection Plan Cost Recovery Clause filings pursuant to Rule 25-6.031, F.A.C. The Commission has opened Docket No. 2020092-EI to address Storm Protection Plan Cost Recovery Clause petitions to be filed the third quarter of 2020.

cycle. As such, approximately 1/8 of the distribution poles in each inspection zone are inspected annually.

At this time, FPL has not identified any areas where the Pole Inspection – Distribution Program would not be feasible, reasonable or practical.

## **B. Structures/Other Equipment Inspections – Transmission Program**

### 1. Description of the Program and Benefits

The Structures/Other Inspections – Transmission Program included in the SPP is a continuation of FPL's existing Commission-approved transmission inspection program. Below is an overview of FPL's existing transmission inspection program and the associated benefits.

#### *a. Overview of the Transmission Inspection Program*

In 2006, as part of its Storm Preparedness Initiative No. 3, the Commission required electric utilities to develop and implement plans to fully inspect all transmission structures, substations, and all hardware associated with these facilities on a six-year cycle. Consistent therewith, FPL implemented a Commission-approved transmission inspection plan in 2006 and has continued that plan to date.

Under its Commission-approved transmission inspection plan, FPL inspects its transmission circuits, substations, and other equipment on a six-year cycle. Additionally, all of FPL's transmission structures are visually inspected from the ground each year. Finally, FPL performs climbing or bucket truck inspections on all wood transmission structures on a six-year cycle and all steel and concrete structures on a ten-year cycle.

Inspections for wood structures include an overall assessment of the condition of the structures, as well as other pole/structure components including the foundation, all attachments, insulators, guys, cross-braces, cross-arms, and bolts. If a wood transmission structure does not pass visual inspection, it is designated for replacement with a concrete or steel transmission structure.

For steel and concrete structures, the visual inspection includes an overall assessment of the structure condition (e.g., cracks, chips, exposed rebar, and rust) as well as other pole/structure components including the foundation, all attachments, insulators, guys, cross-braces, cross-arms, and bolts. If a concrete or steel pole/structure fails the inspection, it is designated for repair or replacement.

The SPP will continue FPL's current transmission inspection program which requires: (a) transmission circuits and substations and all associated hardware to be inspected on a six-year cycle; (b) wood structures to be inspected visually from the ground each year and climbing or bucket truck inspections to be conducted on a six-year cycle; and (c) steel and concrete structures to be inspected visually each year and climbing or bucket truck inspections to be conducted on a ten-year cycle.

*b. Benefits of the Transmission Inspection Program*

As noted in Section IV(A)(1)(b) above, the Commission has found numerous benefits and reasons justifying inspections of electrical utility facilities, including transmission facilities. Importantly, the transmission system is the backbone of the electric grid. While outages associated with distribution facilities (e.g., a transformer, lateral or feeder) can result in an outage affecting anywhere from a few customers up to several thousands of customers, a transmission related outage can affect tens of thousands of customers. Additionally, an outage on a transmission facility could cause cascading (a loss of power at one transmission facility can trigger the loss of power on another interconnected transmission facility, which in turn can trigger the loss of power on another interconnected transmission facility, and so on) and result in the loss of service for hundreds of thousands of customers. As such, it is imperative that transmission facilities be properly inspected using appropriate cycles and standards to help ensure they are prepared for storms.

Further, the performance of FPL's transmission facilities during recent storm events indicates FPL's transmission inspection program has contributed to the overall storm resiliency of the transmission system and provided savings in storm restoration costs. The table below compares the performance of FPL's transmission system for Hurricane Wilma, which occurred in 2005 before FPL implemented its current transmission

inspection program, and Hurricane Irma, which occurred in 2017 after FPL implemented its current transmission inspection program:

<b>Transmission Facilities</b>	<b>Hurricane Wilma</b>	<b>Hurricane Irma</b>	<b>Improvement</b>
Line Section Outages	345	215	38%
Substation Outages	241	92	62%
Structures Failed	100	5	95%

As shown above, the impacts on FPL’s transmission facilities associated with Hurricane Irma were significantly reduced from those experienced with Hurricane Wilma, even though Hurricane Irma’s winds were stronger and its path impacted substantially more of FPL’s facilities. As reflected in the Commission’s reasoning for mandating transmission facility inspections, FPL submits that its systematic transmission inspection program is a key factor for this improved performance.

2. Actual/Estimated Start and Completion Dates

The SPP will continue FPL’s ongoing Commission-approved transmission inspection program described above. This requires FPL to inspect: (a) transmission circuits and substations and all associated hardware on a six-year cycle; (b) wood structures to be visually inspected from the ground each year and conduct climbing or bucket truck inspections on a six-year cycle; and (c) steel and concrete structures visually each year and conduct climbing or bucket truck inspections on a ten-year cycle.

3. Cost Estimates

Estimated/actual annual transmission inspection costs are a function of the number of inspections estimated to be/actually completed and the transmission facilities estimated to be/actually remediated/replaced as a result of those annual inspections. Although the inspection costs are operating expenses, the vast majority of the transmission inspection program costs are capital costs resulting from remediation/replacement of facilities that fail inspection.

The table below provides a comparison of the 2017-2019 total actual transmission inspection costs with the 2020-2022 (first three years of the SPP) total estimated

transmission inspection costs and the 2020-2029 total estimated transmission inspection costs:

	<b>Total Program Costs (millions)</b>	<b>Annual Average Program Costs (millions)</b>
2017-2019	\$128	\$43
2020-2022	\$97	\$32
2020-2029	\$500	\$50

Further details regarding the SPP estimated transmission inspection costs, including estimated annual capital expenditures and operating expenses, are provided in Appendix C.<sup>15</sup>

4. Comparison of Costs and Benefits

As provided in Section IV(B)(3) above, during 2020-2029, total costs for FPL's Structures/Other Inspections – Transmission Program are expected to average approximately \$50 million per year. Benefits associated with the Structures/Other Inspections – Transmission Program discussed in Sections II and IV(B)(1)(b) above, include avoiding outages that can affect tens of thousands of customers and, in particular, cascading outages where the loss of service can affect hundreds of thousands of customers.

5. Criteria used to Select and Prioritize the Program

As explained above, FPL visually inspects from the ground all transmission structures on an annual basis. For the inspection of transmission circuits and substations and all associated hardware, the facilities are selected/prioritized throughout FPL's service territory based on the last cycle's inspection dates, to ensure that facilities are inspected in compliance with the established six-year inspection cycle. Similarly, for bucket truck or climbing inspections, structures are selected/prioritized throughout FPL's service territory based on the last cycle's inspection dates, to ensure that structures are inspected

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<sup>15</sup> See footnote 14.

in compliance with the established six-year (wood) and ten-year (steel and concrete) cycles.

At this time, FPL has not identified any areas where the Structures/Other Inspections – Transmission Program would not be feasible, reasonable or practical.

### **C. Feeder Hardening (EWL) – Distribution Program**

#### **1. Description of the Program and Benefits**

The Feeder Hardening (EWL) – Distribution Program included in the SPP is a continuation of FPL's existing Commission-approved approach (most recently approved in Docket No. 20180144-EI) to harden existing feeders and certain critical distribution poles, as well as FPL's initiative to design and construct new pole lines and major planned work to meet the NESC's extreme wind loading criteria ("EWL"). FPL will continue the distribution feeder hardening program until 2024, when FPL expects 100% of its feeders to be hardened or underground. Below is an overview of FPL's existing distribution feeder hardening program and the associated benefits.

#### **a. Overview of the Distribution Feeder Hardening Program**

The foundation for FPL's distribution feeder hardening program was the extensive forensic and other analyses that FPL conducted after Hurricane Wilma.<sup>16</sup> These analyses concluded that "wind only" (as opposed to, for example, trees or other flying debris) was the predominant root cause of distribution pole breakage. This data, together with the overall performance of FPL's transmission poles that were already built to the NESC EWL standards and the performance of hardened feeders during Hurricanes Matthew and Irma, formed the basis for FPL's feeder hardening strategy.

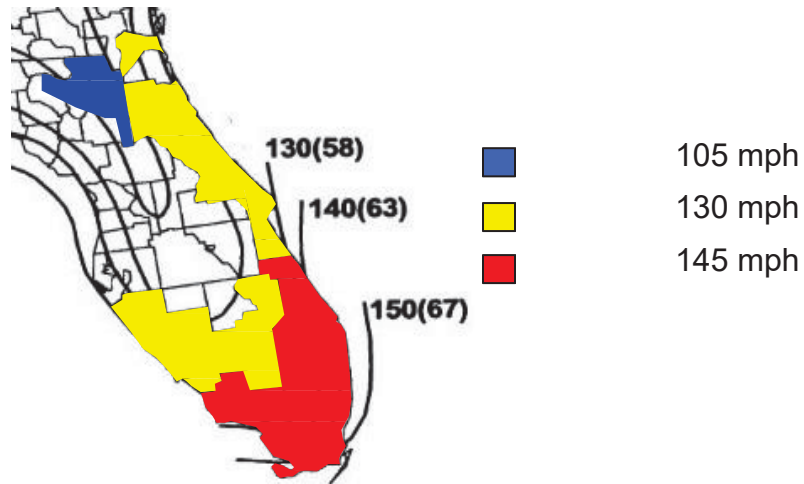
The SPP will continue FPL's previously approved approach to apply EWL criteria to harden existing distribution feeders and certain critical poles. The NESC extreme wind map for Florida will continue to be applied to FPL's system by dividing the application of

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<sup>16</sup> These analyses were conducted either directly by FPL or with the aid of external resources (e.g., KEMA, Inc.).

EWL into three wind regions, corresponding to expected extreme winds of 105, 130 and 145 mph, as shown below.

**FPL Extreme Wind Regions - mph (meter/sec)**



By evaluating each of the counties served by FPL, including each county's applicable wind zones, FPL determined that utilizing three extreme wind regions of 105, 130 and 145 mph for its service territory was appropriate for the following reasons:

- A smaller number of wind regions generate advantages through efficiency of work methods, training, engineering and administrative aspects (e.g., standards development and deployment); and
- Using 105, 130 and 145 mph wind zones is a well balanced approach that recognizes differences in the EWL requirements in the counties within each region.

The SPP will also continue to utilize FPL's Design Guidelines and processes that apply EWL criteria to the design and construction of new pole lines and major planned work, including pole line extensions and relocations and certain pole replacements. Depending on the scope of the work that is performed in a particular project, this could result in the EWL hardening of an entire circuit (in the case of large-scale projects) or in EWL hardening of one or more poles (in the case of small projects) so that the affected circuit will be in a position to be fully EWL hardened in the future. The Design Guidelines are

primarily associated with changes in pole class, pole type, and desired span lengths to be utilized. The Design Guidelines standardize the design and construction of new pole lines and major planned work to ensure that these projects align with FPL's hardening strategy.

FPL's current pole sizing guidelines provide for a minimum installation of: Class 2 wood poles for all new feeder and three-phase lateral work; Class 3 wood pole for two-phase and single-phase lateral work; and Class 3 wood pole for service and secondary work. For critical poles, FPL's current pole sizing guidelines provide for the installation of concrete poles at accessible locations. These guidelines significantly increase the wind ratings (up to nearly 50 percent) from the Design Guidelines in place prior to 2007. FPL's current Distribution Design Guidelines are provided in Appendix D.

To determine how an existing overhead circuit or critical pole will be hardened, a field survey of the circuit facilities is performed. By capturing detailed information at each pole location, such as pole type, class, span distance, attachments, wire size, and framing, a comprehensive wind-loading analysis can be performed to determine the current wind rating of each pole, and ultimately the circuit itself. This data is then used to identify specific pole locations on the circuit that do not meet the desired wind rating. For all poles that do not meet the applicable EWL, FPL develops recommendations to increase the allowable wind rating of the pole.

FPL plans to continue to utilize its "design toolkit" that focuses on evaluating and using cost-effective hardening options for each location, including:

- Storm Guying – Installing a guy wire in each direction perpendicular to the line, which is a very cost-effective option but is dependent on proper field conditions;
- Equipment Relocation – Moving equipment on a pole to a stronger pole nearby;
- Intermediate Pole – Installing an additional single pole within long span lengths, which reduce the span length and increases the wind rating of both adjacent poles;



- Upgrading Pole Class – Replacing the existing pole with a higher class pole to increase the pole’s wind rating; and;
- Undergrounding Facilities – Evaluated on a case-by-case basis using site-specific factors and conditions.

These options are not mutually exclusive and, when used in combination with sound engineering practices, provide cost-effective methods to harden a circuit. FPL’s design recommendations also take into consideration issues such as hardening, mitigation (minimizing damage), and restoration (improving the efficiency of restoration in the event of failure). Since multiple factors can contribute to losing power after a storm, utilizing this multi-faceted approach to pole design helps to reduce the amount of work required to restore power to a damaged circuit.

*b. Benefits of the Distribution Feeder Hardening Program*

Distribution feeders are the backbone of the distribution system and are critical component to providing safe and reliable electric service to FPL’s customers. Thus, improving the storm resiliency of distribution feeders logically provides substantial benefits for customers. Therefore, hardening distribution feeders has been and continues to be one of FPL’s highest storm hardening priorities.

During the period 2006-2019, FPL hardened over 1,300 existing feeders, the vast majority being Critical Infrastructure Function (“CIF”) feeders (*i.e.*, feeders that serve hospitals, 911 centers, police and fire stations, water treatment facilities, county emergency operation centers) and Community Project feeders (*i.e.*, feeders that serve other key community needs like gas stations, grocery stores, and pharmacies) throughout FPL’s service territory. Additional feeders were hardened as a result of FPL’s Priority Feeder Initiative, a reliability program that targeted feeders experiencing the highest number of interruptions and/or customers interrupted. As of year-end 2019, approximately 54% of FPL’s feeders were either hardened or placed underground. Additionally, FPL has hardened 125 highway crossings and over 300 “01” switches (first pole out of a substation with a feeder switch). FPL also applied EWL to the design and construction of new pole

lines and major planned work, including pole line extensions and relocations and certain pole replacements.

As provided in previous FPL Annual Reliability Report filings and three-year Storm Hardening Plan filings (per Rule 25-6.0342, F.A.C.) hardened feeders perform better than non-hardened feeders. This has been demonstrated in-day-to-day reliability performance and during severe storms. For example, when comparing day-to-day reliability performance, hardened feeders have performed 40% better than non-hardened feeders. Also, during Hurricanes Matthew and Irma, hardened feeders performed better than non-hardened feeders.

Additionally, in Docket No. 20170215-EU, the Commission reviewed the electric utilities' storm hardening and storm preparedness programs and found for Hurricane Irma that: (1) outage rates were nearly 20% less for hardened feeders than non-hardened feeders; (2) CMH to restore hardened feeders were 50% less than non-hardened feeders (primarily due to hardened feeders experiencing less damage than non-hardened hardened feeders); and (3) hardened feeders had significantly less pole failures as compared to non-hardened feeders.<sup>17</sup>

## 2. Actual/Estimated Start and Completion Dates

FPL initiated its feeder hardening initiative in 2006. As of year-end 2019, there are approximately 1,600 feeders remaining to be hardened or placed underground. FPL expects to harden approximately 250-350 feeders annually, with 100% of FPL's feeders expected to be hardened or underground by year-end 2024 and with the final costs of the program to be incurred in 2025.

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<sup>17</sup> See *Review of Florida's Electric Utility Hurricane Preparedness and Restoration Actions 2018*, Docket No. 20170215-EU (July 24, 2018), available at <http://www.psc.state.fl.us/library/filings/2018/04847-2018/04847-2018.pdf>.

3. Cost Estimates

Estimated distribution feeder hardening costs are determined utilizing the length of each feeder, the average historical feeder hardening cost per mile, and updated cost assumptions (e.g., labor and materials).

The table below provides a comparison of the 2017-2019 total actual distribution feeder hardening costs with the 2020-2022 (first three years of the SPP) total estimated distribution feeder hardening costs and the total estimated distribution feeder hardening costs to be incurred over the period of 2020-2025<sup>18</sup>:

	<b>Total Program Costs (millions)</b>	<b>Annual Average Program Costs (millions)</b>
2017-2019	\$1,492	\$497
2020-2022	\$1,958	\$653
2020-2025	\$3,206	\$534

Further details regarding the SPP distribution feeder hardening costs, including estimated annual capital expenditures are provided in Appendix C.<sup>19</sup>

4. Comparison of Costs and Benefits

As provided in Section IV(C)(3) above, during 2020-2025, total costs for FPL’s Feeder Hardening (EWL) – Distribution Program average approximately \$534 million per year through 2025. Benefits associated with the Feeder Hardening (EWL) – Distribution Program discussed in Sections II and IV(C)(1)(b) above, include improved storm resiliency as well as improved day-to-day reliability.

5. Criteria used to Select and Prioritize the Program

As explained above, there are approximately 1,600 feeders remaining to be hardened or placed underground. FPL attempts to spread its annual projects throughout its service territory. In prioritizing the remaining existing feeders to be hardened each year,

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<sup>18</sup> It is currently estimated that 100% of FPL’s feeders will be hardened or underground by year-end 2024, with the final costs to be incurred in 2025.

<sup>19</sup> See footnote 14.

considerations include the feeder's historical reliability performance, restoration difficulties (e.g., environmentally sensitive areas, islands with no vehicle access, river crossings, etc.), on-going or upcoming internal/external projects (e.g., FPL maintenance or system expansion projects, municipal overhead/underground conversion project or municipal road project) and geographic location.

At this time, FPL has not identified any areas where the Feeder Hardening (EWL) – Distribution Program would not be feasible, reasonable or practical.

## **D. Lateral Hardening (Undergrounding) – Distribution Program**

### **1. Description of the Program and Benefits**

In 2018, FPL implemented a three-year Commission-approved SSUP Pilot. The SSUP Pilot is a program that targets certain overhead laterals for conversion from overhead to underground. As part of its SPP, FPL will expand undergrounding laterals in 2021-2029. Below is an overview of FPL's Lateral Hardening (Undergrounding) – Distribution Program and the associated benefits.

#### **a. Overview of the Distribution Lateral Hardening Program**

As part of the SPP, FPL will complete its existing approved three-year SSUP Pilot (in 2020) and expand the application of the SSUP during 2021-2029 to the implementation of the system-wide Lateral Hardening (Undergrounding) – Distribution Program. The SSUP Pilot targeted certain overhead laterals that were impacted by recent storms and that have a history of vegetation-related outages and other reliability issues for conversion from overhead to underground. Key objectives of the SSUP Pilot included validating conversion costs and identifying cost savings opportunities, testing different design philosophies, better understanding customer impacts and sentiments, and identifying barriers (e.g., obtaining easements, placement of transformers, and attaching entities' issues).

Two design options are being utilized when FPL converts overhead laterals to underground, referred to as the North American and the European designs. The North American design currently is the predominant design, but both undergrounding designs eliminate all overhead lateral and service wire. The North American design generally

utilizes more primary conductor and a greater number of smaller-sized transformers, with less customers per transformer, and is better suited for front lot construction and service. The European design utilizes more secondary conductor, and a smaller number of larger-sized transformers, with more customers per transformer, and is better suited for rear lot construction and service. Where practical, FPL attempts to relocate existing facilities from the rear of to the front of customers' premises; however, there are instances where that option is not available (e.g., FPL is unable to obtain easements in front of customers' premises). FPL's standard design is the North American design (front lot construction), but FPL is gaining important experience and knowledge from its utilization of the European design (rear lot construction), which it can then better utilize for future projects as appropriate.

As part of the conversion process, FPL is also installing meter base adaptors that allow underground service to be provided to the customer by utilizing the existing meter and meter enclosure. The meter base adaptors minimize the impact on customer-owned equipment and facilities. For example, in certain situations, overhead to underground conversions of electric service can trigger a local electrical code requirement that necessitates a customer upgrade of the home's electric service panel. This can cost the customer thousands of dollars. However, by utilizing a meter base adaptor, overall costs are reduced and customers are able to avoid the need and expense to convert their electrical service panels.

*b. Benefits of the Distribution Lateral Hardening Program*

Laterals make up the majority of FPL's distribution system. For example, system-wide, there are over 180,000 laterals (including laterals with multi-stage fusing), in contrast to approximately 3,300 feeders, and there are 1.8 times as many miles of overhead laterals as there are overhead feeders (approximately 23,000 miles vs. 13,000 miles, respectively). Additionally, while feeders are predominately located in the front of customers' premises, many laterals are "rear of" or behind customers' premises. This is especially the case in older neighborhoods located throughout FPL's service territory. Generally, facilities in the rear of customers' premises take longer to restore than facilities in front of customers' premises because rear-located facilities are more difficult to access

and are more likely to be near vegetation. This results in a greater amount of CMH being devoted to laterals during storm restoration.

The basis for FPL's SSUP Pilot and the proposal to expand upon the Pilot under the SPP is the performance of the underground facilities as compared to overhead facilities and the extensive damage to the overhead facilities caused by vegetation during Hurricanes Matthew and Irma. This performance was demonstrated by the results of FPL's analysis referenced above in Section IV(A)(1)(b) and contained in the Commission's *Review of Florida's Electric Utility Hurricane Preparedness and Restoration Actions in 2018*,<sup>20</sup> which is summarized in the table below:

<b>Storm and Facility</b>	<b>Laterals Out</b>	<b>Total Laterals</b>	<b>% Out</b>
Matthew OH	3,473	82,729	4%
Matthew UG	238	101,892	0.2%
Irma OH	20,341	84,574	24%
Irma UG	3,767	103,384	4%

Finally, it is important to note that underground facilities also perform better than overhead facilities on a day-to-day basis. For example, based on the reliability performance metrics for overhead and underground facilities provided to the Commission in FPL's February 28, 2020 Annual Reliability Report filing, the System Average Interruption Duration Index ("SAIDI") for underground facilities is significantly better than hybrid facilities (combination of overhead and underground) or overhead facilities as shown in the table below:

<b>Year</b>	<b>SAIDI<sup>21</sup></b>		
	<b>UG</b>	<b>OH</b>	<b>Hybrid</b>
2015	21.4	102.4	60.0
2016	17.2	80.4	57.6
2017	17.7	89.6	55.5
2018	21.2	89.0	54.2
2019	30.3	87.4	49.4

<sup>20</sup> See footnote 17.

<sup>21</sup> See pages 93-97 of FPL's February 28, 2020 Annual Reliability Report filing for more details on day-to-day reliability performance - overhead vs. underground.

2. Actual/Estimated Start and Completion Dates

FPL’s SSUP Pilot was initiated in 2018. By the end of 2020, the third and final year of the SSUP Pilot, FPL expects to have converted a total of 220-230 laterals from overhead to underground, which is consistent with the SSUP Pilot’s plan most recently approved in Docket No. 20180144-EI. As part of its SPP, FPL will incorporate, continue, and expand the SSUP to provide the benefits of underground lateral hardening throughout its system. After completing the SSUP Pilot in 2020, FPL estimates it will convert 300-700 laterals annually. In 2024-2029 FPL estimates it will convert 800-900 laterals annually.

3. Cost Estimates

Estimated lateral undergrounding costs are determined utilizing the length of each lateral, the average historical lateral undergrounding cost per mile, and updated cost assumptions (e.g., labor and materials). The table below provides a comparison of the 2018-2019 total actual costs for the SSUP Pilot with the 2020-2022 (first three years of the SPP) total estimated distribution lateral hardening program costs and the 2020-2029 total estimated distribution lateral hardening program costs:

	<b>Total Program Costs (millions)</b>	<b>Annual Average Program Costs (millions)</b>
2018-2019 <sup>22</sup>	\$76	\$38
2020-2022	\$676	\$225
2020-2029	\$5,101	\$510

Further details regarding the SPP estimated distribution lateral hardening program costs, including estimated annual capital expenditures are provided in Appendix C.<sup>23</sup>

4. Comparison of Costs and Benefits

As provided in Section IV(D)(3) above, during 2020-2029, total costs for FPL’s Lateral Hardening (Undergrounding) – Distribution Program average approximately \$510 million per year. Benefits associated with the Lateral Hardening (Undergrounding) – Distribution

<sup>22</sup> The Storm Secure Underground Program Pilot was initiated in 2018.

<sup>23</sup> See footnote 14.

Program discussed in Sections II AND IV(D)(1)(b) above, include improved storm resiliency as well as improved day-to-day reliability.

#### 5. Criteria used to Select and Prioritize the Program

FPL will select/prioritize future laterals for conversion to undergrounding based on an overall feeder performance methodology. Rather than selecting individual “stand-alone” laterals, FPL will underground all the laterals on a feeder such that when a hardened feeder that has experienced an outage is restored, all associated underground laterals would also be restored (unless the underground lateral was damaged).

On average, there are currently 20-30 overhead laterals on a feeder. The selection and prioritization of the laterals to be converted will be based on a methodology that considers: (a) all of the overhead laterals on each feeder; (b) outage experience during the recent Hurricanes Matthew and Irma; (c) the number of vegetation-related outages experienced over the most recent 10 years; and (d) the total number of lateral and transformer outages experienced over the most recent 10 years. These overhead lateral factors are totaled for each feeder, and the feeders are ranked based on these totals. All laterals on the feeders will then be hardened according to the ranking of each feeder.

In order to optimize resources and provide lateral hardening throughout FPL’s system, lateral hardening projects will be performed annually in all sixteen (16) of FPL’s management areas. At this time, FPL has not identified any areas where the Lateral Hardening (Undergrounding) – Distribution Program would not be feasible, reasonable, or practical. However, in areas that are more prone to flooding or storm surge, FPL will consider alternative construction methods (e.g., elevating transformer pads).

### **E. Wood Structures Hardening (Replacing) – Transmission Program**

#### 1. Description of the Program and Benefits

The Wood Structure Hardening (Replacing) – Transmission Program included in the SPP is a continuation of FPL’s existing transmission hardening program through the end of 2022, when FPL expects that 100% of its transmission structures will be steel or concrete.



Below is an overview of FPL's existing transmission wood structure hardening program and the associated benefits.

a. Overview of the Transmission Hardening Program

While FPL's transmission facilities were affected by the 2004 and 2005 storms, the damage experienced was significantly less than the damage sustained by distribution facilities. A primary reason for this resulted from the fact that transmission structures were, at that time, already constructed to meet EWL consistent with Florida Statute 366.04 and the National Electrical Safety Code, Rule 250 C.

Based on the forensic data collected from the 2004 and 2005 storms, FPL implemented a Commission-approved transmission storm hardening initiative to replace all wood transmission structures, which accounted for nearly 70 percent of all transmission structures replaced during the 2004-2005 storm seasons, with steel or concrete structures. As explained below, this initiative is ongoing and expected to be completed by the end of 2022. As part of its SPP, FPL will continue its initiative to replace all wood transmission structures with steel or concrete structures.

b. Benefits of the Transmission Hardening Program

While an outage associated with distribution facilities (e.g., a transformer, lateral, or feeder) can impact up to several thousands of customers, a transmission-related outage can result in an outage affecting tens of thousands of customers. Additionally, an outage on a transmission facility could cause cascading (a loss of power at one transmission facility can trigger the loss of power on another interconnected transmission facility, which in turn can trigger the loss of power on another interconnected transmission facility, and so on) and result in the loss of service for hundreds of thousands of customers. As a result, the prevention of transmission-related outages is essential. As discussed earlier, while transmission facilities performed significantly better than distribution facilities during the 2004 and 2005 storms, there were several opportunities for improvement identified, including the replacement of wood transmission structures. As a result of its transmission inspection programs and its replacement of wood transmission structures, FPL's transmission facilities have demonstrated to be more storm resilient.

The table below compares the performance of FPL’s transmission system for Hurricane Wilma, which occurred in 2005 before FPL implemented its current transmission hardening program, and Hurricane Irma, which occurred in 2017 after FPL implemented its current transmission hardening program:

	<b>Hurricane Wilma</b>	<b>Hurricane Irma</b>
% Line Section Outages	37%	17%
Transmission Structure Failures	100	5 (all non-hardened)
Transmission Substations De-energized	241	92
Days to Restore Substation Outages	5	1

As shown above, the impacts on FPL’s transmission facilities associated with Hurricane Irma were significantly reduced from those experienced with Hurricane Wilma, even though Hurricane Irma’s winds were stronger and its path impacted substantially more of FPL’s facilities.

2. Actual/Estimated Start and Completion Dates

FPL implemented its transmission hardening program in 2007. As of year-end 2019, 96% of FPL’s transmission structures, system-wide, were steel or concrete, with less than 2,900 (or 4%) wood structures remaining to be replaced. FPL expects to replace the 2,900 wood transmission structures remaining on its system by year-end 2022.

3. Cost Estimates

Estimated/actual annual transmission hardening costs are a function of the number of poles to be replaced, actual historical replacement costs, and updated cost assumptions (e.g., labor and materials). The vast majority of the transmission hardening program costs are capital costs resulting from replacement of the wood transmission structures.

The table below provides a comparison of the 2017-2019 total actual transmission hardening costs with the 2020-2022 (first three years of the SPP) total estimated transmission hardening costs:<sup>24</sup>

	<b>Total Program Costs (millions)</b>	<b>Annual Average Program Costs (millions)</b>
2017-2019	\$162	\$54
2020-2022	\$118	\$39

Further details regarding the SPP estimated transmission hardening costs, including estimated annual capital expenditures and operating expenses, are provided in Appendix C.<sup>25</sup>

4. Comparison of Costs and Benefits

As provided in Section IV(E)(3) above, during 2020-2022, total costs for FPL's Wood Structure Hardening (Replacing) – Transmission Program average approximately \$39 million per year. Benefits associated with the Wood Structure Hardening (Replacing) – Transmission Program discussed in Sections II and IV(E)(1)(b) above, include improved storm resiliency.

5. Criteria used to Select and Prioritize the Program

The annual prioritization/selection criteria for the remaining wood structures to be replaced includes proximity to high wind areas, system importance, customer counts, and coordination with other storm initiatives (e.g., distribution feeder hardening). Other economic efficiencies, such as opportunities to perform work on multiple transmission line sections within the same transmission corridor, are also considered.

At this time, FPL has not identified any areas where the replacement of the remaining wood transmission structures under the Wood Structure Hardening (Replacing) – Transmission Program would not be feasible, reasonable or practical.

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<sup>24</sup> FPL expects that 100% of the remaining wood transmission structures in its system will be replaced by year-end 2022.

<sup>25</sup> See footnote 14.

## **F. Substation Storm Surge/Flood Mitigation Program**

### **1. Description of the Program and Benefits**

The Substation Storm Surge/Flood Mitigation Program is the only new program included in FPL's SPP. As explained below, Substation Storm Surge/Flood Mitigation Program is a new program to mitigate damage at several targeted distribution and transmission substations that are susceptible to storm surge and flooding during extreme weather events.

Historically, several FPL distribution and transmission substations have been impacted by storm surge and/or flooding as a result of extreme weather conditions. For example, as a result of flooding caused by Hurricanes Matthew and Irma, FPL's St. Augustine substation was required to be proactively de-energized (*i.e.*, shut down before water reached levels that would cause significant damage to powered substation equipment). Another example is FPL's South Daytona substation that was proactively de-energized during Hurricane Irma as a result of flooding. While proactively de-energizing those substations impacted by storm surge and/or flooding helps reduce damage to substation equipment, FPL is still required to implement both temporary flood mitigation efforts and repairs to substation facilities and equipment that become flooded as a result of extreme weather conditions.

An outage associated with distribution substations can impact up to several thousands of customers, and an outage associated with a transmission substation can result in an outage affecting tens of thousands of customers. Flooding and the need to proactively de-energize substations located in areas susceptible to storm surge and flooding can result in significant customer outages. For example, the flooding and de-energization of St. Augustine and South Daytona during Hurricane Irma resulted in more than 8,000 customer outages. Therefore, the prevention of outages at transmission and distribution substations due to storm surge or flooding is essential.

To prevent/mitigate future substation equipment damage and customer outages due to storm surge and flooding, FPL's new Substation Storm Surge/Flood Mitigation Program will target and harden certain substations located in areas throughout FPL's service

territory that are susceptible to storm surge or flooding during extreme weather events. Specifically, FPL plans to raise the equipment at certain substations above the flood level and construct flood protection walls around other substations to prevent/mitigate future damage due to storm surge and flooding.

2. Actual/Estimated Start and Completion Dates

At this time, FPL has identified between 8-10 substations where it initially plans to implement storm surge/flood mitigation measures over the next three years (2020-2022). FPL plans to initiate construction in late summer/early fall 2020 to raise the equipment at the St. Augustine substation, which is expected to be completed in 2021. In 2021 and early 2022, FPL also plans to begin construction on flood protection walls for the other 7-9 substations identified for mitigation, which is expected to be completed by 2022.

3. Cost Estimates

The storm surge/flood mitigation costs associated with St. Augustine substation (raising substation equipment) are estimated to be approximately \$10 million in total (2020 and 2021). Estimated storm surge/flood mitigation costs for the remaining 7-9 substations identified at this time (constructing surrounding flood walls) are estimated to be approximately \$13 million in total (2021 and 2022). See the table below the estimated annual program costs:

	<b>Total Program Costs (millions)</b>	<b>Annual Average Program Costs (millions)</b>
2020-2022	\$23	\$8

Further details regarding the SPP estimated storm surge/flood mitigation costs, including estimated annual capital expenditures and operating expenses, are provided in Appendix C.<sup>26</sup>

4. Comparison of Costs and Benefits

As provided in Section IV(F)(3) above, during 2020-2022, total costs for FPL's Substation Storm Surge/Flood Mitigation Program average approximately \$8 million per year.

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<sup>26</sup> See footnote 14.

Benefits associated with this program discussed in Section IV(F)(1) above, include improved storm resiliency (avoiding storm surge/flood damage), reduced customer outages and storm restoration costs.

5. Criteria used to Select and Prioritize Projects

The annual prioritization/selection criteria for the targeted substations is based on FPL's historical storm surge/flood experience, in particular, Hurricanes Matthew and Irma. At this time, for the targeted substations, FPL has not identified any areas where the upgrades would not be feasible, reasonable or practical.

**G. Vegetation Management – Distribution Program**

1. Description of the Program and Benefits

The Vegetation Management – Distribution Program included in the SPP is a continuation of FPL's existing Commission-approved Vegetation Management – Distribution Program. Below is an overview of FPL's existing Vegetation Management – Distribution Program and the associated benefits.

a. Overview of the Vegetation Management – Distribution Program

Prior to 2006, FPL's Vegetation Management – Distribution Program consisted of inspecting and maintaining its feeders on a three-year average trim cycle and performing targeted trimming on certain feeders more frequently (e.g., targeting vegetation with faster growth rates and palm trees) through its "mid-cycle" program. Lateral trimming was prioritized based on reliability performance. Another important component of this program was FPL's "Right Tree Right Place" initiative, which provided information to educate customers on FPL's vegetation management program and practices, safety issues, and the importance of placing trees in the proper location.

After the 2004-2005 storm seasons, the Commission determined that the "vegetation management practices of the investor-owned electric utilities do not provide adequate assurance that tree clearances for overhead distribution facilities are being maintained in a manner that is likely to reduce vegetation related storm damage. We believe that

utilities should develop more stringent distribution vegetation management programs.”<sup>27</sup> As result, FPL proposed and the Commission approved the continuation of FPL’s system-wide three-year average trim cycle for feeders, mid-cycle targeted trimming for certain feeders, and its Right Tree Right Place initiative, as well as the implementation of a new six-year average trim cycle for laterals.<sup>28</sup> These same initiatives, which have provided storm and day-to-day reliability benefits, remain in place today.

Tree limbs and branches, especially palm fronds, are among the most common causes of power outages and momentary interruptions during both day-to-day operations and storm events. The primary objective of FPL’s Vegetation Management – Distribution Program is to clear vegetation in areas where FPL is permitted to trim from the vicinity of distribution facilities and equipment in order to provide safe, reliable, and cost-effective electric service to its customers. The program is comprised of multiple initiatives designed to reduce the average time customers are without electricity as a result of vegetation-related interruptions. These include preventive maintenance initiatives (planned cycle and mid-cycle maintenance), corrective maintenance (trouble work and service restoration efforts), customer trim requests, and support of system improvement and expansion projects, which focus on long-term reliability by addressing vegetation that will impact new or upgraded overhead distribution facilities.

FPL’s Vegetation Management Distribution Program’s practices follow the NESC, the American National Standards Institute (“ANSI”) A-300, and all other applicable standards, while considering tree species, growth rates, and the location of trees in proximity to FPL’s facilities. Danger or hazard trees (leaning, structurally damaged, or diseased/dead that have a high likelihood to fail and impact FPL’s facilities) located outside of right-of-way (“ROW”), which cannot be trimmed without approval from the property owner, are identified as candidates for customer-approved removal.

Finally, a very important component of FPL’s vegetation program is providing information to customers to educate them on the company’s trimming program and practices, safety issues, and the importance of placing trees in the proper location – FPL’s “Right Tree,

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<sup>27</sup> See Order No. PSC-06-0351-PAA-EI.

<sup>28</sup> See Order No. PSC-07-0468-FOF-EI.

Right Place” initiative. Right Tree, Right Place is a public education program based on FPL’s core belief that providing reliable electric service and sustaining the natural environment can go hand-in-hand and is a win-win partnership between the utility and its customers.

The SPP will continue FPL’s currently-approved distribution vegetation program, which includes the following system-wide vegetation management activities: three-year cycle for feeders; mid-cycle targeted trimming for certain feeders; six-year cycle for laterals; and continued education of customers through its Right Tree, Right Place initiative.

b. *Benefits of the Vegetation Management – Distribution Program*

In Order No. PSC-07-0468-FOF-EI, the Commission confirmed that FPL should continue to implement three-year and six-year average cycles for its feeders and laterals because the cycles complied with the Commission’s storm preparedness objectives to increase the level of trimming over historical levels, promote system reliability and reduce storm restoration costs.<sup>29</sup> Additionally, Commission’s orders indicated that FPL’s proposed cycles: were cost-effective; would improve day-to-day “tree SAIFI” from 0.22 to 0.16 in ten years;<sup>30</sup> and would provide savings when comparing savings on a customers interrupted (“CI”) per storm basis. Further, day-to-day distribution tree SAIFI has significantly improved as a result of FPL implementing its approved distribution vegetation management program (from 0.20 prior to the 2004-2005 storm seasons to 0.08 at year-end 2019).

Finally, another indication that the current program is providing benefits is that, while forensic analysis indicated vegetation was the overwhelming primary cause for pole and wire failures and a significant cause of outages during Hurricanes Matthew and Irma, the vast majority of damage resulted from uprooted trees, broken trunks, and broken limbs

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<sup>29</sup> FPL’s proposed three-year and six-year cycles were initially approved in Order No. PSC-06-0781-PAA-EI.

<sup>30</sup> The tree-related SAIFI has averaged less than 0.09 over the last few years.



that fell into distribution facilities from outside of right-of-way, *i.e.*, beyond where FPL is currently allowed trim without approval from the property owner.

2. Actual/Estimated Start and Completion Dates

FPL's ongoing vegetation management plan was originally approved in 2007, and remains in place today. Under the SPP, FPL plans to inspect and maintain, on average, approximately 15,200 miles annually, including approximately 11,400 miles for feeders (cycle and mid-cycle) and 3,800 miles for laterals. This is comparable to the approximately 15,200 miles inspected and maintained annually, on average, for 2017-2019.

3. Cost Estimates

The vast majority of vegetation management costs are associated with cycle and mid-cycle trimming, which is performed by several FPL-approved contractors throughout FPL's system. Other vegetation management costs include costs associated with day-to-day restoration activities (*e.g.*, summer afternoon thunderstorms), removals, debris cleanup, and support (*e.g.*, arborists, supervision, back office support). Costs associated with vegetation management are generally operating expenses.

The table below provides a comparison of the 2017-2019 total actual distribution vegetation management costs with the 2020-2022 (first three years of the SPP) total estimated distribution vegetation management costs and the 2020-2029 total estimated distribution vegetation management costs:<sup>31</sup>

	<b>Total Program Costs (millions)</b>	<b>Annual Average Program Costs (millions)</b>
2017-2019	\$189	\$63
2020-2022	\$183	\$61
2020-2029	\$596	\$60

Further details regarding the SPP estimated distribution vegetation management costs,

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<sup>31</sup> The vegetation management costs shown in the table below exclude storm-related vegetation management costs.

including estimated annual capital expenditures and operating expenses, are provided in Appendix C.<sup>32</sup>

#### 4. Comparison of Costs and Benefits

As provided in Section IV(G)(3) above, during 2020-2029, total costs for FPL's Vegetation Management – Distribution Program average approximately \$60 million per year. Benefits associated with the Vegetation Management – Distribution Program discussed in Sections II and IV(G)(1)(b) above, include increased storm resiliency.

#### 5. Criteria Used to Select and Prioritize the Program

The primary reason for maintaining feeders on a three-year average cycle, as opposed to a six-year average cycle for laterals, is that a feeder outage can affect, on average, approximately 1,500 customers as compared to an outage on a lateral line that can affect, on average, approximately 35 customers. FPL enhances its approved feeder inspection and trimming plan through its mid-cycle trimming program, which encompasses patrolling and trimming feeders between planned maintenance cycles to address tree conditions that may cause an interruption prior to the next planned cycle trim. Mid-cycle work units typically have a trim age of 12 to 18 months and usually involve certain fast-growing trees (e.g., palm trees) that need to be addressed before the next scheduled cycle trim date.

Additionally, customers often contact FPL with requests to trim trees around distribution lines in their neighborhoods and near their homes. As a result of these discussions with customers and/or a follow-up investigation, FPL either performs the necessary trimming or determines that the requested trimming can be addressed more efficiently by completing it through the normal scheduled cycle trimming.

Cycle trimming is prioritized annually to ensure compliance with cycle schedules. At this time, FPL has not identified any areas where the Vegetation Management – Distribution Program would not be feasible, reasonable or practical.

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<sup>32</sup> See footnote 14.

## H. Vegetation Management – Transmission Program

### 1. Description of the Program and Benefits

The Vegetation Management – Transmission Program included in the SPP is a continuation of FPL's existing transmission vegetation management program. Below is an overview of FPL's existing transmission vegetation management program and the associated benefits.

#### a. Overview of the Vegetation Management - Transmission Program

The North American Electric Reliability Corporation's (NERC) vegetation management standards/requirements serve as the basis for FPL's transmission vegetation management program. The reliability objective of these standards/requirements is to prevent vegetation-related outages that could lead to cascading by utilizing effective vegetation maintenance while recognizing that certain outages such as those due to vandalism, human errors, and acts of nature are not preventable. Transmission lines that must conform with these standards/requirements include lines operated at or above 200 kV or any line that is either an element of the Interconnection Reliability Operating Limit (IROL) or the Western Electricity Coordinating Council (WECC).

For FPL, just over 4,300 miles of its transmission system (or nearly two-thirds of all of FPL's total transmission system) are subject to NERC's vegetation management standards/requirements. NERC's vegetation management standards/requirements include annual inspection requirements, executing 100% of a utility's annual vegetation work plan, and to prevent any encroachment into established minimum vegetation clearance distances ("MVCD").

The key elements of FPL's transmission vegetation management program are to inspect the transmission right-of-ways, document vegetation inspection results and findings, prescribe a work plan, and execute the work plan.

FPL conducts ground inspections of all transmission corridors annually for work planning purposes. During these inspections, FPL identifies vegetation capable of approaching the defined Vegetation Action Threshold ("VAT"). VAT is a calculated distance from the

transmission line that factors in MVCD, conductor sag/sway potential, and a buffer. The identified vegetation is given a work prescription and then prioritized and organized into batches of work, which collectively become the annual work plan.

For transmission lines that are subject to NERC's vegetation management standards/requirements, FPL also uses a technology called "LiDAR," short for light detection and ranging. LiDAR is a remote sensing technology that uses light in the form of a pulsed laser to measure ranges (distances) to a target. For vegetation management purposes, LiDAR is used to measure distance between vegetation and transmission lines. LiDAR patrols are conducted annually for all NERC transmission corridors. Data collected by the LiDAR patrols is then used to develop annual preventative and reactive work plans.

In its SPP, FPL will continue its current transmission vegetation management plan, which includes visual and aerial inspections of all transmission line corridors, LiDAR inspections of NERC transmission line corridors, developing and executing annual work plans to address identified vegetation conditions, and identifying and addressing priority and hazard tree conditions prior to and during storm season.

b. *Benefits of the Vegetation Management – Transmission Program*

The benefits of a Vegetation Management – Transmission Program are self-evident and the consequences of not having a reasonable transmission vegetation management plan can be extreme. As discussed previously, the transmission system is the backbone of the electric grid. While outages associated with distribution facilities (e.g., a transformer, lateral, or feeder) can result in an outage affecting anywhere from a few customers up to several thousands of customers, a transmission related outage can affect tens of thousands of customers. Additionally, an outage on a transmission facility could cause cascading and result in the loss of service for hundreds of thousands of customers. As such, it is imperative that vegetation impacting transmission facilities be properly maintained using reasonable and appropriate cycles and standards to help ensure they are prepared for storms. For these reasons, it is no surprise that NERC has developed

prescriptive vegetation management requirements for transmission facilities to help prevent such damage from occurring.

FPL also notes that while vegetation-related damage and transmission line outages occurred during Hurricanes Matthew and Irma, the vast majority of such damages/outages were caused by vegetation located outside of the right-of-way, *i.e.*, beyond where FPL is currently allowed to trim without approval from the property owner, which further demonstrates that FPL's historical efforts in this area have been beneficial.

## 2. Actual/Estimated Start and Completion Dates

FPL's Vegetation Management – Transmission Program is an ongoing program, initiated decades ago. Under the SPP, FPL plans to inspect and maintain, on average, approximately 7,000 miles annually, including approximately 4,300 miles for NERC transmission line corridors and 2,700 miles for non-NERC transmission line corridors. This is comparable to the approximately 7,000 miles inspected and maintained annually, on average, for 2017-2019.

## 3. Cost Estimates

The vast majority of vegetation management costs are associated with annual inspections and the execution of planned work to address identified conditions, which is performed by several FPL approved contractors throughout FPL's system. Other vegetation management costs include costs associated with day-to-day restoration activities (*e.g.*, summer afternoon thunderstorms), removals, debris cleanup, and support (*e.g.*, arborists, supervision, back office support). Costs associated with vegetation management are generally operating expenses.

The table below provides a comparison of the 2017-2019 total actual transmission vegetation management costs with the 2020-2022 (first three years of the SPP) total estimated transmission vegetation management costs and the 2020-2029 total estimated transmission vegetation management costs:<sup>33</sup>

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<sup>33</sup> The vegetation management costs shown in the table below exclude storm-related vegetation management costs.

	<b>Total Program Costs (millions)</b>	<b>Annual Average Program Costs (millions)</b>
2017-2019	\$27	\$9
2020-2022	\$27	\$9
2020-2029	\$96	\$10

Further details regarding the SPP estimated transmission vegetation management costs, including estimated annual capital expenditures and operating expenses, are provided in Appendix C.<sup>34</sup>

4. Comparison of Costs and Benefits

As provided in Section IV(H)(3) above, during 2020-2029, total costs for FPL’s Vegetation Management – Transmission Program average approximately \$10 million per year. Benefits associated with the Vegetation Management – Transmission Program discussed in Sections II and IV(H)(1)(b) above, include increased storm resiliency. The execution of FPL’s Vegetation Management – Transmission Program is a significant factor in mitigating damage to transmission facilities and avoiding transmission-related outages.

5. Criteria used to Select and Prioritize the Programs

Priority vegetation conditions and hazard tree conditions are completed annually prior to storm season. Additionally, prior to and during the storm season, FPL conducts aerial inspections of transmission corridors to identify hazard trees and any priority vegetation locations. Priority vegetation conditions and hazard tree conditions identified through aerial inspections are addressed as soon as possible.

At this time, FPL has not identified any areas where the Vegetation Management – Transmission Program would not be feasible, reasonable or practical.

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<sup>34</sup> See footnote 14.

## **V. Detailed Information on the First Three Years of the SPP (2020-2022)**

### **A. Detailed Description for the First Year of the SPP (2020)**

The following additional information required by Rule 25-6.030(3)(e)(1), F.A.C., for the first year of the SPP (2020) is provided in Appendix E. (1) the actual or estimated construction start and completion dates; (2) a description of the affected existing facilities, including number and type(s) of customers served, historic service reliability performance during extreme weather conditions, and how this data was used to prioritize the storm protection projects; (3) a cost estimate including capital and operating expenses. A description of the criteria used to select and prioritize the storm protection programs is included in the description of each SPP program provided in Section IV.

### **B. Detailed Description of the Second and Third Years of the SPP (2021-2022)**

Additional details required by Rule 25-6.030(3)(e)(2), F.A.C., for the second and third years of the SPP (2021-2022), including the estimated number and costs of projects under every program, is provided in in Appendix C.

### **C. Detailed Description of the Vegetation Management Activities for the First Three Years of the SPP (2020-2022)**

The following additional information required by Rule 25-6.030(3)(f), F.A.C., for the first three years of the vegetation management activities under the SPP (2020-2022) is provided in n Sections IV(G) and IV(H) above and Appendix C: the projected frequency (trim cycle); the projected miles of affected transmission and distribution overhead facilities; the estimated annual labor and equipment costs for both utility and contractor personnel. A description of how the vegetation management activities will reduce outage times and restoration costs due to extreme weather conditions is provided in Sections IV(G) and IV(H) above.

## **VI. Estimate of Annual Jurisdictional Revenue Requirements for the 2020-2029 SPP**

Pursuant to Rule 25-6.030(3)(f), F.A.C., the table below provides the estimated annual jurisdictional revenue requirements for each year of the SPP.

<b>Estimated Annual Revenue Requirements (millions)</b>	
2020	\$257.3
2021	\$368.8
2022	\$494.0
2023	\$625.2
2024	\$760.6
2025	\$877.9
2026	\$963.4
2027	\$1,036.8
2028	\$1,110.7
2029	\$1,185.0

While FPL has provided estimated costs by program as of the time of this filing and associated total revenue requirements in its SPP, consistent with the requirements of Rule 25-6.030, F.A.C., subsequent projected and actual program costs submitted for cost recovery through the Storm Protection Plan Cost Recovery Clause (per Rule 25-6.031, F.A.C.,) could vary by as much as 10-15%, which would then also impact associated estimated revenue requirements and rate impacts. The projected costs, actual/ estimated costs, actuals costs, and true-up of actual costs to be included in FPL's Storm Protection



Plan Cost Recovery Clause will all be addressed in subsequent filings in separate storm protection plan cost recovery clause dockets pursuant to Rule 25-6.031, F.A.C.<sup>35</sup>

## **VII. Estimated Rate Impacts for First Three Years of the SPP (2020-2022)**

FPL anticipates the programs included in the SPP will have zero bill impacts on customer bills during the first year of the SPP and only minimal bill increases for years two and three of the SPP. An estimate of hypothetical overall rate impacts for the first three years of the SPP (2020-2022), without regard for the fact that FPL remains under a general base rate freeze pursuant to a Commission-approved settlement agreement through December 31, 2021, as stated in footnote 36 below are based on the total program costs reflected in this filing.<sup>36</sup> The projected costs, actual/estimated costs, actuals costs, and true-up of actual costs to be included in FPL's Storm Protection Plan Cost Recovery Clause will all be addressed in subsequent filings in Storm Protection Plan Cost Recovery Clause dockets pursuant to Rule 25-6.031, F.A.C.<sup>37</sup>

Pursuant to Rule 25-6.031, F.A.C., FPL has not identified any reasonable implementation alternatives that could mitigate the resulting rate impact for each of the first three years of the SPP. As explained above, FPL's SPP is largely a continuation of existing Commission-approved storm hardening programs and initiatives, which have already demonstrated that they have and will continue to provide increased T&D infrastructure resiliency, reduced restoration time, and reduced restoration costs when FPL's system is impacted by severe weather events. Further, as explained above, the estimated costs

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<sup>35</sup> The Commission has opened Docket No. 20200092-EI to address Storm Protection Plan Cost Recovery Clause petitions to be filed the third quarter of 2020.

<sup>36</sup> Pursuant to Rule 25-6.030(3)(h), F.A.C., the hypothetical rate impacts for FPL's typical residential, commercial, and industrial customers for the first three years of the SPP (2020-2022) without regard for the fact that FPL remains under a general base rate freeze pursuant to a Commission-approved settlement agreement through December 31, 2021, are as follows for 2020, 2021, and 2022, respectively: Residential (RS-1) \$0.00250/kWh, \$0.00357/kWh, and \$0.00478/kWh; Commercial (GSD-1) \$0.81/kW, \$1.15/kW, and \$1.54/kW; and Industrial (GSLDT-3) \$0.05/kW, \$0.08/kW and \$0.10/kW. These rate impacts are for all programs included in the SPP and are based on the total estimated costs as of the time of this filing, which could vary by as much as 10% to 15%, regardless of whether those costs will be recovered in FPL's Storm Protection Plan Cost Recovery Clause or through base rates.

<sup>37</sup> See footnote 34.

for the programs included in FPL's SPP are consistent with the historical costs incurred for the existing storm hardening and storm preparedness programs, which were most recently approved in FPL's 2019-2021 Storm Hardening Plan.

## **VIII. Conclusion**

The Florida Legislature has determined that it is in the State's interest to "strengthen electric utility infrastructure to withstand extreme weather conditions by promoting the overhead hardening of distribution and transmission facilities, undergrounding of certain distribution lines, and vegetation management," and for each electric utility to "mitigate restoration costs and outage times to utility customers when developing transmission and distribution storm protection plans." Section 366.96(1), F.S. Based on these findings, the Florida Legislature concluded that it is in the State's interest for each electric utility to develop and file a SPP for the overhead hardening and increased resilience of electric T&D facilities, undergrounding of electric distribution facilities, and vegetation management. See Sections 366.96(1)-(3).

FPL's SPP is a systematic approach to achieve the legislative objectives of reducing restoration costs and outage times associated with extreme weather events and enhancing reliability. As explained above, FPL's SPP is largely a continuation and expansion of its existing and already successful storm hardening and storm preparedness programs previously approved by the Commission, as well as a new storm hardening program to harden certain targeted substations that are susceptible to storm surge or flooding during extreme weather events. Based on the recent experiences of Hurricanes Matthew and Irma, the existing storm hardening programs have a demonstrated and proven track record of mitigating and reducing restoration CMH, outage times, and storm restoration costs, as well as improving day-to-day reliability. FPL's SPP will continue and expand these important benefits to customers and the State.

**CERTIFICATE OF SERVICE**

I HEREBY CERTIFY that a true and correct copy of the foregoing was served by electronic delivery to the following parties of record this 12 day of May, 2020:

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