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-VIA ELECTRONIC FILING-

Ms. Carlotta S. Stauffer
Commission Clerk
Florida Public Service Commission
2540 Shumard Oak Blvd.
Tallahassee, FL 32399-0850

RE: Docket No.: 20170215-EU
In re: Review of Electric Utility Hurricane Preparedness and Restoration
Actions

Dear Ms. Stauffer:

Please find enclosed for electronic filing a copy of Florida Power & Light Company's Second Supplemental Amended response to Staff's First Data Request No. 29 in the above mentioned docket.

If there are any questions regarding this transmittal, please contact me at (561) 304-5170.

Sincerely,

/s/ Kevin I.C. Donaldson
Kevin I.C. Donaldson
Fla. Bar No. 0833401

Enclosure
cc: Counsel for Parties of Record (w/encl.)

QUESTION:

Please complete the table below summarizing hardened facilities that required repair or replacement as a result of Hurricanes Matthew, Hermine, Irma, Maria, and Nate.

RESPONSE:

FPL does not maintain its accounting records at the level of detail required to provide the requested information as they do not differentiate hardened facilities from non-hardened facilities, nor do they track which assets were repaired. However, FPL does track certain assets, at the total system level, that were requested and replaced during each hurricane as reflected in the tables below. Note, FPL did not track storm repairs/replacements for Hurricanes Maria and Nate as Hurricane Maria did not impact FPL's service territory and Nate had limited impact. Also, Hurricanes Matthew and Irma capital details associated with follow-up work are not yet available by plant account as these costs have not yet been unitized from account 106 to account 101 by plant account.

Hurricane Matthew	Number of Facilities Requiring	
	Repair	Replacement
Transmission		
Structures	N/A	0
Substations	N/A	0
Total	N/A	0
Distribution		
Poles	N/A	656
Substation	N/A	0
Feeder OH	N/A	0
Feeder UG	N/A	0
Feeder Combined	N/A	0
Lateral OH	N/A	N/A
Lateral UG	N/A	N/A
Lateral Combined	N/A	N/A
Total	N/A	N/A
Service		
Service OH	N/A	N/A
Service UG	N/A	N/A
Service Combined	N/A	N/A
Total	N/A	N/A

Hurricane Hermine	Number of Facilities Requiring	
	Repair	Replacement
Transmission		
Structures	N/A	0
Substations	N/A	0
Total	N/A	0
Distribution		
Poles	N/A	19
Substation	N/A	0
Feeder OH	N/A	0
Feeder UG	N/A	0
Feeder Combined	N/A	0
Lateral OH	N/A	N/A
Lateral UG	N/A	N/A
Lateral Combined	N/A	N/A
Total	N/A	N/A
Service		
Service OH	N/A	N/A
Service UG	N/A	N/A
Service Combined	N/A	N/A
Total	N/A	N/A

Hurricane Irma	Number of Facilities Requiring	
	Repair	Replacement
<i>Transmission</i>		
Structures	N/A	0
Substations	N/A	0
Total	N/A	0
<i>Distribution</i>		
Poles	N/A	3,562
Substation	N/A	0
Feeder OH	N/A	0
Feeder UG	N/A	0
Feeder Combined	N/A	0
Lateral OH	N/A	N/A
Lateral UG	N/A	N/A
Lateral Combined	N/A	N/A
Total	N/A	N/A
<i>Service</i>		
Service OH	N/A	N/A
Service UG	N/A	N/A
Service Combined	N/A	N/A
Total	N/A	N/A

Notes:

For Hurricane Matthew, there is a difference of 248 poles between what is provided in this discovery response for total poles replaced (656 poles) and what is provided in FPL's post-storm forensic review report for Hurricane Matthew (provided in FPL's response to Staff's Second Data Request No. 2 in this same docket) for poles that failed and needed to be replaced to restore service (408 poles). The difference is associated with poles replaced during "follow-up" - i.e., poles that were damaged (e.g., a cracked pole) as a result of the storm and needed to be replaced to restore the pole to its pre-storm condition - but did not fail during the storm and, thus, did not need to be replaced to restore service. As mentioned above in FPL's response to this data request, FPL's accounting records do not differentiate hardened facilities from non-hardened facilities and FPL did not track or maintain forensic information on the 248 distribution poles replaced as a result of follow-up work. As a result, FPL does not have a hardened vs. non-hardened breakdown for the 248 distribution poles replaced during follow-up work.

The distribution pole and transmission structure counts provided above represent the amount of pole/structure replacements FPL has recorded on its books and records associated with Hurricane Irma as of December 31, 2017. These amounts should be considered preliminary at this time as they are subject to change (e.g., the counts do not reflect poles that will be replaced during follow-up work, which has yet to be completed).

N/A – Information is not available at this level of detail in FPL’s accounting records.

For substations and feeders, FPL has stated 0 since no entire substation or feeder was replaced. However, these facilities consist of many pieces of equipment (e.g., wire, cable, breakers, transformers, cross arms and arrestors) some of which may have been replaced.

2016/2017 Hurricanes - FPL Restoration/Infrastructure Performance

FPL’s infrastructure/restoration performance for Hurricanes Matthew (2016) and Irma (2017) demonstrates that the implementation and execution of its FPSC-approved (1) ten storm preparedness initiatives (which includes vegetation management): (2) pole inspection programs; (3) storm hardening plans; and (4) tariffs to incent municipal overhead to underground conversions have provided great benefits to FPL’s customers and to the State of Florida.

During 2016 and 2017, FPL’s service territory was threatened with massive Category 4 and 5 storms. The size and scale of these storms impacted FPL’s infrastructure throughout its entire service territory (which encompasses 35 counties in the State of Florida). For both Matthew and Irma, FPL’s infrastructure storm resiliency and smart grid investments resulted in improved infrastructure resiliency performance and reduced restoration times.

2016/2017 Hurricanes - Restoration Performance

FPL saw significant improvements in overall restoration results. As can be seen in the table below, restoration results for Hurricanes Matthew and Irma show significant improvement vs. Hurricane Wilma. FPL attributes these significant improvements in restoration to the investments made to make its system smarter and more storm-resilient as well as its well-tested restoration processes. This includes FPL’s distribution and transmission storm hardening and storm preparedness initiatives, pole inspection programs, smart grid initiatives, vegetation management programs and continuous efforts to improve its restoration processes.

	Wilma 2005	Matthew 2016	Irma 2017
Customer Outages	3.2M	1.2M	4.4M
% Restored / days	50% / 5	99% / 2	50% /1
All restored / days	18	4	10
Avg. to restore / days	5.4	<1	2.1

2016/2017 Hurricanes – Infrastructure Performance

To assess the effectiveness of FPL's infrastructure storm hardening investments, the Company utilizes information collected through post-storm forensic data collection and various systems (e.g., FPL's outage management system) to conduct post-storm infrastructure performance analysis. These efforts and analysis allow FPL to quantify and assess its distribution and transmission infrastructure performance including the performance of: hardened and non-hardened facilities; overhead and underground facilities; and smart grid performance. For distribution, this includes reviewing the storm performance of poles, feeders and laterals. For transmission, this includes reviewing the storm performance of poles/structures, line sections and substations. The data demonstrates that hardened infrastructure performed better than non-hardened infrastructure, underground facilities performed better than overhead facilities and smart grid devices prevented a significant number of outages from occurring.

Distribution/Transmission Poles/ Structures Performance

The performance of FPL's approximately 1.2 million distribution and transmission poles/structures during Hurricanes Matthew and Irma was excellent, as hardened poles and structures performed as expected by minimizing outages and reducing restoration times. The total number of distribution/transmission poles that failed (i.e., had to be repaired/replaced in order to restore service) during Hurricanes Matthew and Irma was a mere fraction of 1% of the 1.2 million pole/structure pole population.

Additionally, hardened distribution and transmission pole performance was significantly better than non-hardened pole performance, as hardened pole failures were either non-existent (e.g., Hurricane Matthew) or significantly less than non-hardened pole failures (e.g., during Hurricane Irma, hardened feeder poles had a 0.02% failure rate, while non-hardened feeder poles had a 0.20% failure rate). Also, total poles replaced (i.e., poles that failed + poles that were replaced during follow-up work) were also a mere fraction of 1% of the total pole population and significantly less than the number of poles replaced during Hurricane Wilma.

FPL notes that for Hurricanes Matthew and Irma, while it did track hardened vs. non-hardened pole performance during restoration, it did not track poles replaced (hardened vs. non-hardened) during follow-up work, since these poles had accomplished their intended purpose of not failing during the storms. Therefore, FPL cannot provide the number of hardened poles replaced during follow up work in Hurricanes Matthew and Irma. Based on the performance of hardened poles that failed during these storms (see table below), it is highly unlikely that there would be a significant number of hardened poles, if any, that needed to be replaced during follow-up work. However, going forward, should the Commission want FPL to track replacement of hardened vs. non-hardened poles during follow-up work, FPL will begin to track this information.

FPL attributes this excellent pole performance to its FPSC-approved distribution and transmission storm hardening plan initiatives (e.g., extreme wind load construction standards for distribution poles and replacing wood transmission poles/structures) and its pole inspection programs.

Distribution Poles 12/31/17

Total Number 1,188,202
Total Hardened 124,518*

* This number is understated as it includes only poles hardened as a result of FPL's approved hardening plan projects, as FPL does not track or maintain the number of hardened poles installed as a result of new construction (e.g., new feeders or laterals) and/or daily work activities (e.g., maintenance, pole line extensions, relocation projects). There are also other existing poles throughout FPL's service territory that would currently meet the NESC's extreme wind loading criteria and therefore qualify as a hardened pole, however, FPL does not currently track or maintain that information.

Distribution Pole Failures*	Hardened	Non-Hardened	Total
Matthew - 2016	0	408	408
Irma - 2017	26	2834	2860

*Broken/Fallen poles that must be repaired/replaced to restore service

Transmission Pole/Structures 12/31/17

Total 66,685
Concrete 60,694 (91%)
Wood 5,991 (9%)

Transmission Pole Failures*	Hardened	Non-Hardened	Total
Matthew - 2016	0	0	0
Irma - 2017	0	5	5

*Broken/Fallen poles that must be repaired/replaced to restore service

Distribution Feeders/Laterals Performance

As demonstrated below, FPL's hardened feeders performed significantly better than non-hardened feeders and underground feeders/laterals performed significantly better than overhead feeders/laterals. Performance was compared considering feeder and lateral outages that occurred during Hurricanes Matthew and Irma. It is also important to note that during Hurricane Irma, the Construction Man Hours ("CMH") to restore hardened feeders was 50% less than non-hardened feeders, primarily due to hardened feeders experiencing less damage than non-hardened feeders.

It is important to note that the majority of outages for overhead facilities resulted from trees that broke and/or fell into FPL's facilities. Many of these trees were outside of easements or public rights of way where FPL is generally allowed to trim. As a result, no additional amount of traditional tree trimming would help mitigate this issue. Tree damage was particularly impactful on FPL laterals.

The two tables below provide feeder and lateral outage performance statistics for Hurricanes Matthew and Irma.

Matthew	Overhead non-Hardened			Overhead Hardened			Underground			Total		
	Out	Pop	% Out	Out	Pop	% Out	Out	Pop	% Out	Out	Pop	% Out
Distribution Feeders	280	2,031	14%	68	721	9%	11	493	2%	359	3,245	13%
Distribution Laterals	3,473	82,729	4%	N.A.	N.A.	N.A.	238	101,892	0.2%	3,711	184,621	2%

Pop = Population; Lateral population includes laterals with multi-stage fusing

IRMA- 2017	Overhead Non-Hardened			Overhead Hardened			Underground			Total		
	Out	Pop	% Out	Out	Pop	% Out	Out	Pop	% Out	Out	Pop	% Out
Distribution Feeders	1,609	1,958	82%	592	859	69%	85	470	18%	2,286	3,287	70%
Distribution Laterals	20,341	84,574	24%	N.A.	N.A.	N.A.	3,767	103,384	4%	24,108	187,958	13%

Pop = Population; Lateral population includes laterals with multi-stage fusing

FPL notes that, overall, for Hurricane Irma, many more laterals experienced outages compared to feeders, thus laterals required significantly more time to restore (871,000 CMH) compared to feeders (170,000 CMH). FPL continues to promote its Right Tree Right Place initiative and recommends there be changes to state laws and/or local ordinances to restrict the type and location of trees and provide utilities additional trimming rights to address existing tree conditions.¹

Additionally, FPL notes that day-to-day, hardened feeders perform approximately 40% better than non-hardened feeders.

Transmission Line Sections/Substations Performance

The transmission system's performance was excellent during Hurricanes Matthew and Irma. Equipment and conductor damage was minimal as a result of our investments in transmission hardening and the installation of flood monitoring equipment in those substations located in flood prone areas. Substations that experienced outages were restored in one day. During Hurricanes Matthew and Irma, flood monitoring equipment operated as expected, providing notification which allowed FPL to proactively de-energize three substations (one in Matthew and two in Irma) and prevent potential serious damage from occurring at these substations.

The tables below provide substation line section outage performance for Hurricanes Matthew and Irma.

¹ Where municipalities are not actively engaged in ensuring appropriate limitations on planting trees in public rights of way, restoration efforts are impeded and made more costly. In fact, one particular municipality is actively planting "wrong trees in the wrong place," in spite of FPL's direct communications and efforts to encourage its Right Tree Right Place initiative.

MATTHEW - 2016	Overhead Non-Hardened			Overhead Hardened			Underground			Total		
	Out	Pop	% Out	Out	Pop	% Out	Out	Pop	% Out	Out	Pop	% Out
Trans. Line Sections	16	350	5%	23*	846	3%	0	49	0%	39	1,245	3%

IRMA - 2017	Overhead Non-Hardened			Overhead Hardened			Underground			Total		
	Out	Pop	% Out	Out	Pop	% Out	Out	Pop	% Out	Out	Pop	% Out
Trans. Line Sections	60	306	20%	142**	884	16%	13***	51	25%	215	1241	17%

* 2 sections were out because substation was proactively de-energized due to flooding
 ** 4 sections were out because substations were proactively de-energized due to flooding
 *** No underground section was damaged or failed causing an outage; however, the sections were out due to line termination equipment in substations.

The table below compares substation outage and restoration performance – Irma vs, Wilma.

<u>Substations</u>	<u>Wilma 2005</u>	<u>Irma 2017</u>
De-energized	241	92
Restored (Days)	5	1

Smart Grid Performance

During Hurricane Matthew and Irma, smart grid devices prevented a significant amount of customer outages, assisted with restoration efforts and reduced restoration time and costs. Specifically, automated feeder switches avoided approximately 664,000 outages during Hurricanes Matthew and Irma. Additionally, FPL’s restoration crews are able to “ping” smart meters before leaving an area to ensure that power is, in fact, restored. This prevents restoration crews from leaving an area, thinking all power was restored, only to be called back when the customer informs FPL that they are still without service. FPL is also enhancing an application, first utilized during Hurricanes Matthew and Irma, whereby it will be able to “bulk meter ping” smart meters to confirm whether customers have service.

Automated Feeder Switches	Avoided Customer Outages
Matthew - 2016	118,000
Irma - 2017	546,000