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April 16, 2018

VIA ELECTRONIC FILING

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

RE: Docket No. 20170215-EU
Review of electric utility hurricane preparedness and restoration activities

Dear Ms. Stauffer:

On behalf of Duke Energy Florida ("DEF"), please find attached a PowerPoint presentation prepared in anticipation for the upcoming Commission workshop on May 2-3, 2018, in the above-referenced Docket.

Thank you for your assistance in this matter. Please feel free to call me at (727) 820-4692 should you have any questions concerning this filing.

Sincerely,

/s/ Dianne M. Triplett

Dianne M. Triplett

DMT/cmkn
Enclosures

cc: Parties of Record

CERTIFICATE OF SERVICE

I HEREBY CERTIFY that a true and correct copy of the foregoing has been furnished to the following by electronic mail this 16th day of April, 2018, to all parties of record as indicated below.

/s/ Dianne M. Triplett
Attorney

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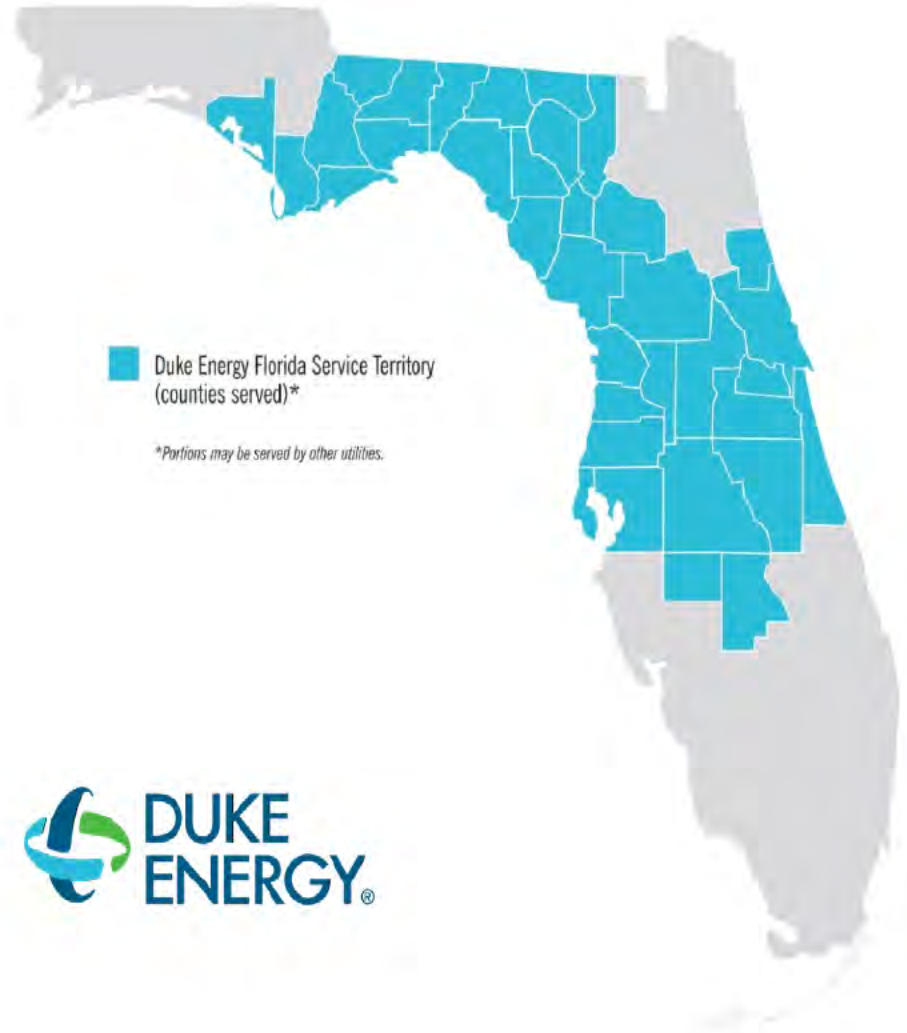


Florida Public Service Commission Hurricane Workshop

May 2, 2018

Service territory includes:

- Service to 1.8 million retail customers in 35 counties
- 20,000 square miles
- More than 5,100 miles of transmission lines and 32,000 miles of distribution lines
- Owns and operates 9,261 MWs (summer) and 10,118 MWs (winter) of generating capacity
 - 76.2 percent gas
 - 21 percent coal
 - 3 percent renewables
 - 0.2 percent oil
 - 2,400 MWs purchased power



Overview of Prevention and Restoration

Overview of Prevention and Restoration

Storm Hardening

- Since 2004, DEF has invested more than \$2 billion to harden its electrical system
- FPSC10-Point maintenance plan
- Wood pole inspection plan
- Storm hardening plan

Vegetation Management (Tree Trimming)

- 3-5 year maintenance trim cycle
- Mid-cycle reactive work
- Hazard tree program
- Herbicide application

Self Healing Technology

- Allows the grid to self-identify problems and react by isolating those areas or rerouting power
- Technology avoided approximately 5 million outage minutes during Hurricane Irma

Grid Investment Plan

- DEF plans to invest \$3.4 billion over the next 10 years to further modernize the grid
- Includes advanced self-healing technology, hardening & resiliency, AMI and targeted undergrounding



Overview of Prevention and Restoration

Operational preparation is a year-round activity

- Transmission & distribution systems inspected and maintained
- Storm organizations drilled and prepared
- Internal and external resource needs secured
- Response plan tested and continuously improved
- Proactively secured 45 base camps/staging sites to support T & D restoration efforts during hurricanes

Mutual Assistance Agreements executed between DEF and other utilities, ensure resources can be timely dispatched and fairly apportioned

- Southeastern Electric Exchange coordinates IOU Mutual Assistance
- Florida Electric Power Coordinating Group coordinates the Intrastate Mutual Aid Agreement
- During Irma, Duke Energy acquired:
 - 12,528 total resources
 - 91 line and vegetation vendors from 25 states
 - Activated 26 independent basecamps, parking/staging sites

Overview of Prevention and Restoration

Coordination with County EOC Officials

- Structured Engagement and Information Sharing Before, During and After Hurricane
- Coordination with county EOC priorities
- Public Communications and Outreach
- DEF works closely with county EOCs to develop awareness of critical facilities. Feeders serving those facilities are prioritized in our restoration plan

Restoration Priorities

Restoration begins at the source and works out to safely restore service to the most customers possible. Many activities occur simultaneously.

1. Transmission Lines
2. Substations
3. Critical Facilities
4. Densely populated areas
5. Individual homes

Grid Improvement Plan

Objective: Implement programs that provide step changes in reliability performance, improve safety for employees and customers, increase customer satisfaction, harden and improve the resiliency of the grid. These investments will better enable the use and application of private Distributed Energy Resources on the Duke Energy grid.

<p>Self Optimizing Grid</p> <ul style="list-style-type: none"> • Transform radial distribution system to an automated distribution network • Add capacity, grid connectivity and control to enable 80 percent of customers served from Self-Optimizing Grid 	<p>Hardening and Resiliency Programs</p> <ul style="list-style-type: none"> • Small wire primary program • Live front switchgear replacement • Transformer retrofit program
<p>Advanced Metering Infrastructure</p> <ul style="list-style-type: none"> • Fewer/shorter outages • Reduced customer calls • Reduce frequency of estimated bills 	<p>Communications Uplift</p> <ul style="list-style-type: none"> • Fiber to substations • Serial to IP • 2G/3G conversions
<p style="text-align: center;">Targeted Undergrounding</p> <p style="text-align: center;">Underground the worst performing and costliest to maintain 10 percent of overhead line miles</p>	
<p>Impacted Performance Metrics</p>	<p>SAIDI, SAIFI and CEMI6 (t)</p>
<p>Expected Benefits</p>	<ul style="list-style-type: none"> • Reduce number of outage events • Reduce restoration time • Increase customer satisfaction • Improve employee and customer safety

Overview of Prevention and Restoration Hurricane Irma

Irma's track northward up the Florida peninsula resulted in a broad swath of hurricane and tropical storm force winds.

Damage

- 2,130 Distribution poles replaced
- 141 Transmission poles replaced
- 324 miles of wire replaced (800 additional miles spliced and repaired)
- 1,653 transformers replaced
- 71 substations out of service
- 124 transmission circuits restored

Restoration Summary			
System Totals	Customers Restored	Peak Customers Out	Outage Events*
	1,738,030	1,284,816	35,196

* Total outage events completed to restore all customers

Restoration

- 1 million customers restored in three days
- As typical with major storms, the remaining restoration work was more time-consuming and labor-intensive (for example, pole climbing in back lot areas where trucks could not access)

Irma was the first hurricane on record to impact all 35 counties served by Duke Energy Florida

Performance of Hardened vs. Non-Hardened Facilities

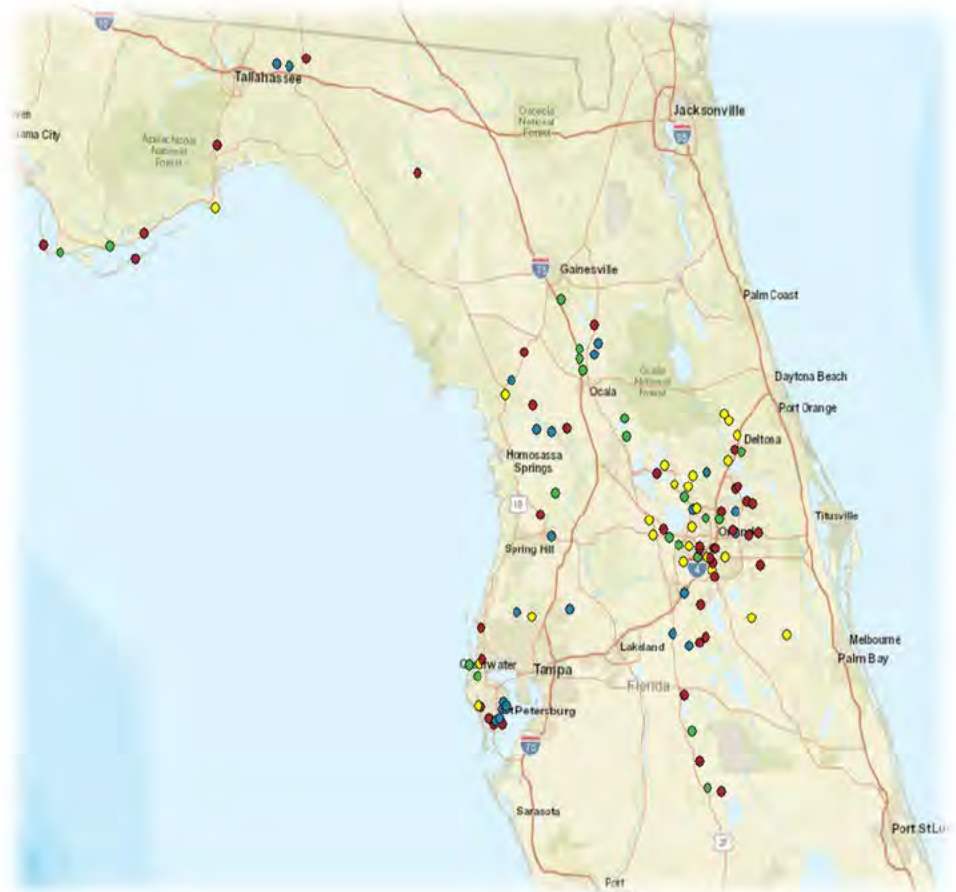
Performance of Hardened vs. Non-Hardened

Since the initiation of the Storm Hardening program, Duke Energy Florida has completed over 100 distribution hardening projects.

The scope of work includes:

- Conductor upgrades
- Feeder ties
- Access improvements
- Extreme wind upgrades

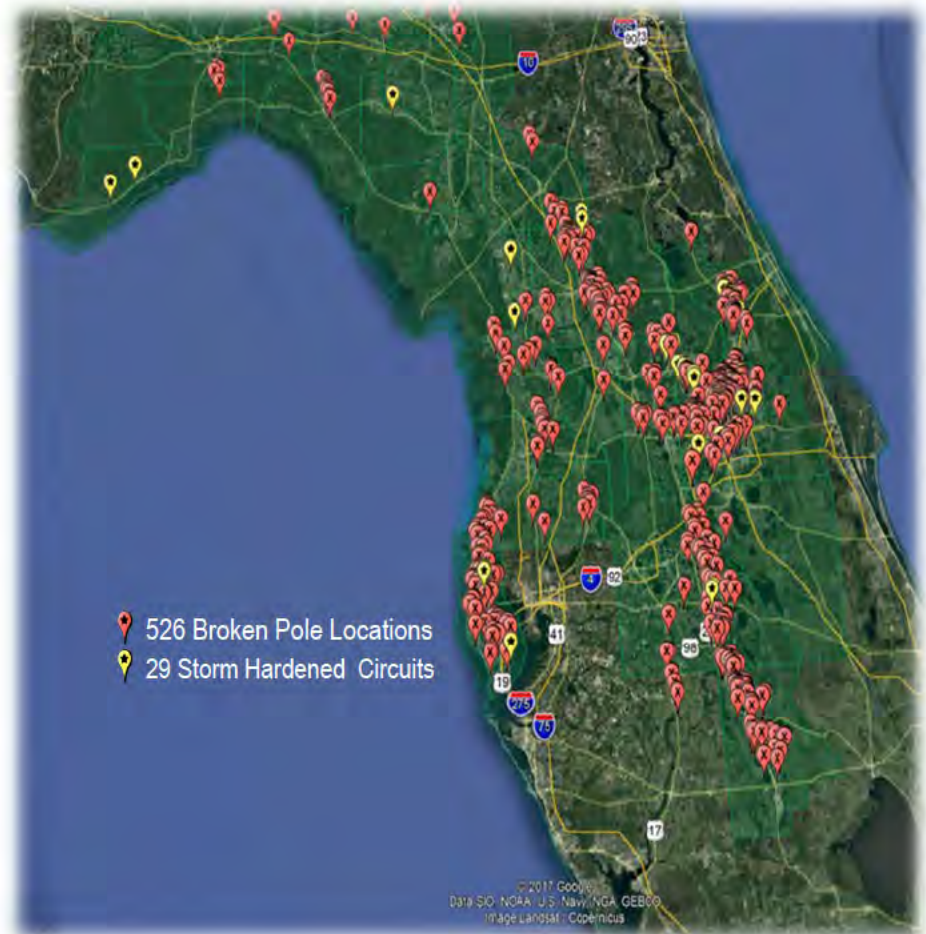
We have replaced **16,500** wooden transmission poles with either steel or concrete and replaced **39,400** wooden distribution poles.



Performance of Hardened vs. Non-Hardened

Hurricane Irma post-storm forensics analysis

- Third-party firm conducted a review of our forensic data.
- Damage assessors randomly assessed 526 broken poles from the total population of 2,130 broken poles.
- Evaluated 29 storm hardened projects, focusing on conductor upgrades in the path of the storm.
- The distribution grid sustained less damage and performed better when normalized against previous storms and comparable events outside of Florida.
- The results of the analysis suggested hardened facilities performed better than non-hardened facilities.



Performance of Overhead vs. Underground Facilities

Overhead vs. Underground

- During catastrophic weather events, both overhead and underground circuits are subject to outages.
- Underground outages typically take longer to restore.
- Duke Energy's experience is that underground facilities suffer a lower percentage of outages in catastrophic weather events.
- The plots on the next three slides show a visual representation of percentage of customers on any given circuit that suffered an outage during each storm for each construction type (overhead or underground).

CAIDI by Hurricane	Overhead	Underground
Hermine	554 minutes	667 minutes
Matthew	1,183 minutes	1,243 minutes
Irma	2,711 minutes	3,975 minutes

Irma Outages OH vs. UG

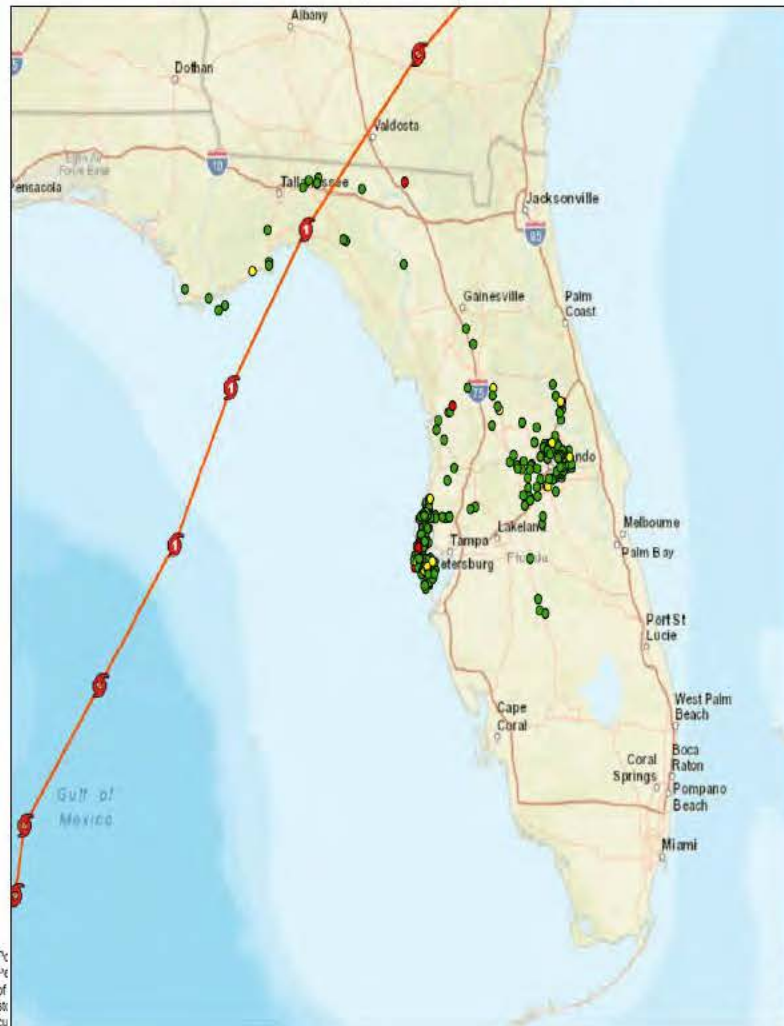
Feeder	OH	1,070
	UG	1,271
	Total	2,341
Lateral	OH	20,330
	UG	1,462
	Total	21,792
Service	OH	14,638
	UG	N/A
	Total	14,638

Overhead vs. Underground

OH Construction Outage Severity - Hurricane Hermine



UG Construction Outage Severity - Hurricane Hermine



- Customers Interrupted**
- > 80%
 - 40 - 80%
 - < 40%
- Hurricane Hermine**
- Tropical Storm
 - Hurricane, Cat 1
 - Path of Storm

Points represent the center point of a feeder circuit. Percent values were calculated as the number of customers experiencing an outage during the storm on the circuit divided by the total number of customers on that circuit.

Overhead vs. Underground

OH Construction Outage Severity - Hurricane Matthew



UG Construction Outage Severity - Hurricane Matthew



Customers Interrupted

- > 80%
- 40 - 80%
- < 40%

Hurricane Matthew

- Hurricane, Cat 2
- Hurricane, Cat 3
- Hurricane, Cat 4
- Path of Storm

Points represent the center point of a feeder circuit. Percent values were calculated as the number of customers experiencing an outage during the storm or the circuit divided by the total number of customers on that circuit.

Overhead vs. Underground

OH Construction Outage Severity - Hurricane Irma



UG Construction Outage Severity - Hurricane Irma



Hurricane Irma

- Tropical Storm
- Hurricane, Cat 1
- Hurricane, Cat 2
- Hurricane, Cat 3

Customers Interrupted

- > 80%
- 40 - 80%
- < 40%

Points represent the center point of a feeder circuit. Percent values were calculated as the number of customers experiencing an outage during the storm on the circuit divided by the total number of customers on that circuit.

Impediments to Restoration

Impediments to Restoration

Road Closures: Reduced the ability to effectively and efficiently mobilize restoration crews, contractors and vendors, fuel/materials/poles/wires.

Critical Facilities: Large number of priority requests to restore service to critical facilities. During Irma, Duke Energy responded to 4,500 EOC missions.

Traffic

- Evacuation and re-entry traffic reduced ability for first responders (including contractors and vendors) to effectively and efficiently mobilize to access impacted areas.
- Due to the magnitude of the storm, the reduced availability of law enforcement agents to provide effective traffic control and convoy support.

Lodging

- Reduced capacity resulting from rooms held for scheduled public events.
- Duke Energy has an Alternative Housing Plan, however hotel accommodations continue to be a component of the overall lodging plan.
- Systematic evacuations from south to north limited the availability of lodging within the transportation corridors.

Customer and Stakeholder Communications

Customer Communications

- Duke Energy Florida state president participated in daily round table calls facilitated by Florida Governor Rick Scott.
- Staffing plans supported state and county EOCs.
- Customers kept informed through emails, outbound calls, print and broadcast interviews and social media
- Storm webpage duke-energy.com/irma website updated several times a day – received 1.2 million page views
- Despite some IT and communication challenges, over 5.7 million outbound customer messages were sent over duration of event

Social Media Channel	Posts	Views	Interactions (likes, comments, shares, clicks and media views)
Facebook	54	2,518,044	1,446,583
Twitter	72	16,462,848	234,689
Total	126	18.9 million	1.6 million

2.169 million Florida calls handled by Customer Care Operations during Irma

Keeping Customers Informed

- Prior to landfall, 700K + hurricane preparedness emails sent to residential and business customers
- Preparedness calls made to 1,500 medical essential customers
- Customers kept informed throughout event with information available via
 - Outbound call campaigns - 5.7M customers
 - 18.9M views of social media content (126 original posts; 23K outbound customer responses throughout duration of event)
 - 3M residential and business emails sent directly to customers
 - Conducted print and broadcast interviews providing preparation, storm status and restoration updates, as well as several national interviews with Duke Energy Florida state president
 - Produced four storm update videos and promoted via social media
 - Captured photos and videos of storm damage and restoration in the field
 - Distributed 13 news releases in both English and Spanish
 - Radio, TV and digital paid advertising in five markets throughout the event. as well as on the Weather Channel



Working with our Customers

We provided flexible options and assistance as our residential and business customers endured hardships and worked to get their lives back to normal after Irma.

Customer moving due to damage from Hurricane Irma

- Waived additional deposit and reconnect fees through the end of the year
- Waived reconnect fees for customers where service orders were delayed due to restoration.

Collections and Deposits – through the end of October

- Late payment charges and disconnects for non-payments were suspended
- Flexible credit arrangements - including zero down and three months to pay

Duke Energy Florida is providing outage letters to customers to support insurance claims, including FEMA.



Keeping Customers Informed - Improvements

- Expanded base of social media customer responders and pre-trained resources to assist call center
- 2nd Quarter 2018 - Automatically enrolling customers with cell or email on file in Proactive Outage Notification Service. (Customers can opt out if outage information is not desired)
- Formal link between communications center and technology team for faster identification of outage management system and/or technology issues
- Contingency plans developed for rapidly switching communications channels where information dependent on outage management system or technology issues**

Pre-Irma	Post Irma
Social Media <ul style="list-style-type: none"> • 50 Corporate/Volunteer responders • 22 Consumer Affairs Responders • 72 Responders 	Social Media <ul style="list-style-type: none"> • 100 Corporate/Volunteer responders • 22 Consumer Affairs Responders • 122 Responders
Proactive Outage Notification <ul style="list-style-type: none"> • 498K DE Florida customers enrolled 	Proactive Outage Notification <ul style="list-style-type: none"> • 594K additional • TOTAL = 1M+ DE Florida customers eligible for auto enrollment (effective Q2)

**Primary channels available for direct customer communications

- Customer Service Representatives
- IVR inbound
- Outbound calls
- Web / outage maps
- Text – Proactive Outage Notification
- Email
- Social Media

Suggested Improvements

Prevention

- Education and coordination with local governments regarding tree trimming, tree removal, and right tree/right place for planting.

Governmental Coordination

- Improved coordination in prioritizing critical facilities.
- Encourage critical customers to develop emergency plans for major storm events.
- Coordinate access to public spaces for logistics and lodging needs (i.e., arenas, civic centers, convention centers).
- Consider requesting the cancellation of public events to increase lodging availability.
- Consider timing of evacuee return travel to minimize interference with restoration activities.

