BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

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In re: Application for limited proceeding for
recovery of incremental storm restoration
costs related to Hurricanes Irma and Nate by
Duke Energy Florida, LLC

Docket No. 20170272-EI

Dated: July 19, 2018

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DUKE ENERGY FLORIDA, LLC'S RESPONSE TO STAFF'S
FIRST REQUEST FOR PRODUCTION OF DOCUMENTS (NO. 1)

Duke Energy Florida, LLC ("DEF"), responds to the Staff of the Florida Public Service Commission's ("Staff") First Request for Production of Documents (No. 1) as follows:

PRODUCTION OF DOCUMENTS

1. Please refer to the direct testimony of witness Cutliffe, page 3, lines 15-16. Please produce any documents identifying best practices and/or lessons learned from Hurricanes Irma and Nate.

    Response:
    Please see the attached documents bearings Bates Numbers 20170272-DEF-STAFF-POD 1-1-00001 through 20170272-DEF-STAFF-POD 1-1-000056.

SUBMITTED this 16th day of July, 2018.

s/ Matthew R. Bernier

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Attorneys for Duke Energy Florida, LLC

CERTIFICATE OF SERVICE

I HEREBY CERTIFY that a true and correct copy of the foregoing has been furnished via electronic mail to the following this 16th day of July, 2018.

/s/ Matthew R. Bernier
Attorney

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1DF'S SUMMARY OF RECEIVED COMMENTS FOR HURRICANE IRMA

Positive Comments Received:

1) Written IAP and plans so field personnel can understand what is being planned higher

2) Briefing content/cadence much better than past events. Allowed for more regimented schedule and kept meetings to the time frame scheduled

3) Use of MY WORLD made navigating around the system area much easier, made tracing out circuits easier than using line drawings and provided some outage information not being received due to OMS not fully functioning

5) Continued/"Off-Season" collaboration that occurred between the regional staffs and commands resulted in good working relationships between the ICs and the staff Chiefs had built common methods of doing planning and logistic support so they were able to assist each other. Overall, the continued cross talk between regional staffs and the command level led to each region effectively supporting the overall 1DF plan.

Opportunity Comments Received:

1) Consider streamlining admin procedures and requirements from a logistics standpoint to avoid crews having to leave worksites.

2) A better tool than ROD must be brought into use. There are numerous products that effectively track off system resources, internal resources and make it easier to input crew information to conduct planning.

2) Crew support in the base camps , specifically handing out hotel keys to individual resources is cumbersome..

3) While the senior level of leadership at the Regions had good planning time, too much time was used by the senior staffs. The extra time Regional staffs used meant the less time the front line leaders had to make a plan.

4) The development of the 1DF staff needs more clarity in how it will operate with each region as well as operate with the IST. Clearly define how the 1DF Staff supports the ability of the CDO to make decisions and provide planning guidance and operational planning to the regional staffs.

5) A full time logistics person(s) is needed within the 1DF structure whose main and only focus is the preparing of sites, vendor management, and ramping up staging/base camps for storms. Logistics is a complex orchestration of competing logistics.

6) Preparing current and relevant information for the PIO/LNO structure is critical to informing our customers and government agencies of current work ongoing, locations(s) that work is occurring and providing the best planning information for customers and government agencies to make decisions. The 0700 report must have relevant information that is current as of that day, that the previous day when the IAP was created.

7) Examine the data used in setting ETRs and the process as documented currently. Determine the best sets of data to make decisions from the multiple sets currently available and determine the priority for relying on that data in terms of setting ETRs. Use the data, as well as feedback from the field, to provide a complete as possible "INTEL" picture before making setting final ETRs and releasing public information.

8) All DA personnel, both leadership and support roles, need additional training. OMS & myWorld training and practice sessions addressing all three OMS platforms should be conducted on a recurring, regular basis, and involve C&M leadership, engineering personnel (including leadership) and back office (admin) personnel.

9) Daily work shifts should not be altered unless the restoration has conclusively reached the very last day of activity.

10) Prepare Standard Briefing Formats for all meetings and products produced to the field. The IAP is a great format to focus on future planning and needs, but does not adequately address the daily operational requirements. Focus on more coordinating instructions in an operations plan, a clearly articulated logistics support plan and provide IC intent and purpose.

Other Action Items to Fold into the ERO:

1) Pushing autonomy/control as low as possible so lower levels can operate quicker

2) The coming of ADMS and using the same procedures throughout each region

3) Ensuring that we have adequate manual back-ups in case automation is not available.

4) Develop Family care plans for single parents that remain on file and kept up to date. This not only prepares lineman to deploy quicker, but also helps the leadership should there be a hardship that prevents an employee from being able to get home to their family.

5) Prepare what criteria must be in place and what parameters must be met to set Go/No Go criteria to deploy crews across the system in support of other regions. Ensure there is clearly stated guidance who provides those answers and make sure they are all answered before making final decisions.

6) The Public Information Office must be used during crew travel so that we can put out good news stories/positive news coverage of our crews deploying.

7) Likewise if PIO is provided a roster of who is traveling and where they are from, that would be very helpful for generating potential media stories.

8) Business Continuity/Contingency Plans need to be revised/updated/created for unexpected happenings such as automation platforms and other relied upon systems not functioning.

9) Crews movements by smaller serials need to be created so that crews move in smaller groups. It makes feeding and fueling easier, especially if relying on commercial support during movements

10) Positioning internal fuel support assets with the travel parties is great and allows fueling to happen quicker

11) Consider whether self-contained teams should be modified or revamped to ensure consistency among regions.

12) Company DA personnel (engineering personnel) should be equipped with smartphones instead of flip phones. Having better technology will provide those doing the DA Surveys greater navigation and communication capabilities and easier exchange of information.

Irma Lessons Learned & OpEx - Supply Chain

Group	Category	Lesson Learned	Op Ex achievement	Op Ex new idea	Op Ex cnhancement	Comments / Status
ICS / BU	Communication	Participation in various ICS teams and daily calls - distribution of the "Daily Irma" report	Y			Supply Chain rep's were present on sub team and overall ICS calls . . . . The distribution of a Daily Irma that communciated key aspects of the storm recovery, shared information related to the flow of materials into the field, and gave feedback continuously was a positive for the event.
ICS / BU	Communication	Early engagement and communication with supply chain		Y	Y	Develop a checklist that includes cut off's for daily orders, runs, etc. and contact information. Allow for emergency runs, but strive to create an orderly deployment for order, pick and deliver activities. (example: once base camp crews leave the location, we should survey the kits, make orders and have the delivery made in time for them to restock overnight, etc.)
ICS / BU	Communication	Base camp improvements to process.		Y	Y	Base Camp set up notifications should clearly specify if restoration materials are to be included at the site. There needs to be a clear communication on which base camps need materials and which ones don't . . . . There was change to sites during the recovery. Improve communication on set ups when decided to ensure coverage. There was adequate coverage during this event.
ICS / BU	Communication	The new ICS structure has the materials organization joining the Logistics team calls. During such a large team call . . . Issues that need detailed work should be taken offline to allow for the entire agenda to be covered.		Y		This is an efficiency idea to be sure all agenda items are covered. Single point of contact for materials. Manager Material Planning or an identified Material Planner.
ICS / BU	Communication	Improve distribution Damage Assessment equipment damage data to impacted parties (i.e. Supply Chain)			Y	The data from the damage assessments that listed estimated number of poles down, etc. was not shared for 2 days. During this time, supply chain would be securing additional supplies and putting logistics plans in place. There were only minor shortages of some parts during the storm, these were usually resolved in the same day and did not impact restoration times.
ICS / BU	Communication	Ask resources to report to sites when they are expected to begin work			Y	Clearly communicate the need to stage in resources to move people efficiently and work to provide awareness so folks are able to use of time onsite.
ICS / BU	Damage Assessment	DA leads should receive more detailed circuit maps			Y	
ICS / BU	Resources	Using the scale of Duke Energy provided skilled resources to the needed region . . . Quick response, already trained, understand our safety culture, etc.	Y			Within Supply Chain, we leveraged our regional employees and national suppliers to bring additional resources to the affected area and were able to work safely, efficiently and effectively due to standard practices, systems, etc.
ICS / BU	Resources	Use local DE line workers to lead out of town crews.		Y		

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ICS / BU	Resources	Fly DE line resources to scene and let them use local line trucks (these lineman would be leading out of town crews)		Y		If you can leverage local worker knowledge, we may be able to see if any additional trucks could be used by other DE workers.
ICS / BU	Resources	Improve crew assignments on restoration tasks			Y	Improve crew assignments on restoration tasks.DA recognizing needs for climbing crews in applicable areas Optimize time between completion of damage assessment and crews working Consider increasing supervisory contact with resources, especially those from other areas.
ICS / BU	Tech/IT	Improve ROD system for workers			Y	Supply Chain teammates in ROD had to secure their own accommodations. System issue.
ICS / BU	Trucking	Escort for material delivery convoy?		Y		In certain events, we should have an ability to call for law enforcement escorts for incoming materials similar to the movement of line crews. While we didn't need this during the storm, for future use, might be good to have as a resource.
Supply Chain	Communication	MIQ - Clear communications on when Duke needs driver teams to avoid shipment delays due to driver rest requirements.		Y		Improve communications on inbound mateirals to ensure sufficient driver teams and DOT compliance when needed. We did not have any issues with this storm.
Supply Chain	Communication	Clarify scope of duty regarding supply of water, Wesco or Storm Logistics (3rd Party)			Y	
Supply Chain	Environmental	Develop better processes for handling leaking transformers at staging sites & operation centers.			Y	Better ways to bag and tag leaking equipment and ability to move it

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Supply Chain	Integrated Supplier	Our Integrated Supplier greatly expanded the capacity of the supply chain to provide uninterrupted supply of materials to crews.	Y	Y	Y	Leveraged our national scale supplier provided additional warehousing space, resources and materials to efficiently flow materials from supplier to crews. They functioned in our storm calls and meetings as an integral part of the team. Find ways to expand their capability during storms to continue to increase service levels. Increase use of this supplier for non-Integrated supplier materials, they have national prescence and may be stocking items across the country.
Supply Chain	Inventory	Use of existing inventory	Y			Substitutions of items in inventory - with business unit approval - provided additional materials to keep crews productive and use existing inventory vs. purchasing new
Supply Chain	Inventory	Storm simulation model		Y		Review storm model and keep current to standards. Use process similar to inventory reviews for slower moving materials.
Supply Chain	Inventory	Review storm materials stocking levels at distribution centers		Y		Work with BU to see how we can adjust for storm season and then consume our way through the inventory by year end. Using new data analytics, we may be able to bring seasonality to materials stocking levels to move materials more efficiently and reduce double handling.
Supply Chain	Purchasing	Adequate materials were provided during storm restoration	Y			Through our contracts with suppliers, Duke Energy had access to adequate materials to keep crews restoring power. There were some minor shortages, but nothing significant.
Supply Chain	Purchasing	Expediting - Increase details on ETA (date AND time) for items			Y	
Supply Chain	Purchasing	Review and update listing of supplier vendor stocking quantities for storm items			Y	Utilize storm support inventory at suppliers as well as our sites, incorporate into sourcing process. We have this in place for some categories.

Irma Lessons Learned & OpEx - Supply Chain

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Supply Chain	Resources	Optimize Supply Chain staffing level at Op Center and base camps			Y	Determine how company operations centers fit into the storm support with the base camps - likely a function of number of resources supporting restoration.
Supply Chain	Storm Kit	Share Storm Kits across Duke Energy regions		Y		We are working to standardize and better identify the items in the storm kits. There might be a "core set" of storm kits that apply to all regions with some specialized kits that apply for certain jurisdictions (voltage differences, etc.). Ensure that additional tools/equipment needed for storm boxes i.e. shrink wrap and tool, zip ties, green banding/tool, and basic hand tools (hammer, screw driver, side cutters, adjustable wrenches etc..) Create a standard for the number of line crews/storm kit that can be supported.
Supply Chain	Tech/IT	Provide technology to resources supporting storms			Y	Need access to our electronic ordering systems. Mifi devices should be a standard part of the base camp setup. May include MiFi, iphone, GPS, additional chargers, etc.
Supply Chain	Tech/IT	Tablet issues when ordering W/S - pop up blocker would not let order process (Clemson & Anderson)			Y	confirm no underlying IT issue - otherwise was this a spot issue?
Supply Chain	Trucking	Material Runners and trucks (pick-ups) at the DC (for smaller emergent deliveries)		Y		Have a capability for small and emergent needs
Supply Chain	Warehouse operations	Develop schedule early that includes cutoff times for orders and associated delivery times / schedule. This to allow for improved organization with logistics / trucking		Y		Develop a cadence for main w/h operations that supports the base camps, operations centers and receiving activities. This will ensure smooth flow of activities, from inbound trucks to outbound trucks to remove bottlenecks at the locations.

Irma Lessons Learned & OpEx - Supply Chain

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Supply Chain	Warehouse operations	When to go 24/7 at Distribution Center(s) and base camps			Y	Using the intensity of storm and/or damage assessment, establish a criterial for around the clock operations.

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FHO Emergency Event After-Action Report - Improvement Plan

Instructions: Immediately following an emergency event the incident commander or their designee shall gather feedback from the personnel who participated in the emergency event response. In the blanks below document the results of this review and forward a copy of this to your **Site Emergency Response Coordinator.**

If applicable, enter these action items into your station action tracking tool.

Site Emergency Response Coordinator: Once this report has been reviewed and finalized forward a copy to Mark Blinson, FHO Emergency Program Manager.

Station & Responding Operations Team:	Emergency Event Date:	Event Start Time: 0800
FHO	September 7, 2017	Event End Time: 2400

Summary of Emergency Event*: (Identify what happened: how the emergency was discovered, what specific information was gathered include all known facts associated with the emergency event)*

Hurricane Irma path over Florida, and associated power plants.

Revised: 11/14/2016

DUKE ENERGY.

FHO Emergency Event After-Action Report - Improvement Plan

What was done to respond to the emergency? (What level was the emergency classified, who was notified, what actions were taken)

Pre-hurricane checklists were complete at Florida and Carolinas' FHO stations, as per the Natural Disaster Emergency Response Procedures. Each station's incident management team, as well as the Florida regional incident management team were briefed, and placed on standby to provide incident command structure (ICS) response to affected facilities. A level 2 emergency, hurricane threat imminent, was declared, and the Incident Support Team (IST) was activated. Daily briefings were provided to the IST as to the status and ultimate recovery of Florida facilities.   No facility was significantly impacted, such that an on-site incident management team, was necessary for station recovery.

FHO Emergency Event After-Action Report - Improvement Plan

(Enclosure Page 3 of 4)

Participating External Organizations / Emergency Responders	
Federal Agencies	None
State Agencies	None
Local Agencies	None

What things went well?	What things need to be improved?
• Recent completion of emergency training and exercises across fleet prepared personel well to respond • Communication across the organization • Utilization of standardized emergency procedures • Completion of hurricane checklists	• Anclote emergency diesel generator was not able to load • Procure satellite telephones for regions

Revised: 11/14/2016

FHO Emergency Event After-Action Report - Improvement Plan

(Enclosure Page 4 of 4)

	Issue or Area for Improvement	Recommended Action	Who's Responsible to Complete this Action	Due Date
1	Emergency Diesel Functionality	Ensure emergency diesel generators are being load tested to verify functionality.	Brandon Sipe	
2	Satellite Telephones	Procure regional satellite telephones for emergency use by different business units.	IT or Enterprise Preparedness Services	
3				
4				
5				

AAR/IP Form Completed by:	Date Completed:
Joe Miller	10/16/2017

Revised: 11/14/2016

Hurricane Irma Florida Recap

November 9, 2017

DUKE ENERGY®
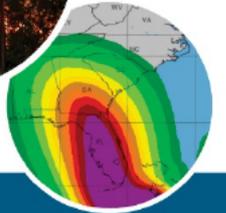
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Agenda

- Storm Summary and Restoration Accomplishments
- Top Issues in Irma experience
    - Estimated Time of Restoration
    - Outage Management System
    - Decision Hierarchy
    - Communications and Customer
    - Other Lessons Learned
- Corrective Actions
- Appendix
    - Chronology
    - Glossary

Methodology

An independent review team worked with the responsible line organizations to determine strengths, lessons learned, and action items as a result of Hurricane Irma response efforts.

Storm Summary and Restoration Accomplishments

Storm Summary

- Record outages affecting approximately 1.3 of 1.8 million customers in all 35 counties served in Florida
- Unprecedented damage pattern with outages occurring indiscriminately versus in large patterns

Restoration Accomplishments

- 1 million customers restored in 3 days
- 96% of Pinellas and Pasco county customers restored by original estimated restoration time
- 1841 distribution poles replaced
- 141 transmission poles replaced
- 178 miles of wire replaced (800 additional miles spliced and repaired)
- 1106 transformers replaced
- 71 substations returned to service
- 2,132,836 Florida calls handled by Customer Care Operations in 10 days

Estimated Time of Restoration (ETR)

ETRs were set before initial damage assessment was sufficiently complete. Contributing to this action was:

- A perceived sense of urgency
- Experience bias
- Unusual storm damage pattern
- Challenges with crew mobilization

Once initial ETRs were published, priorities focused on restoration efforts and not on verifying or further refining ETRs.

Corrective Actions

- Revise governance to include more formality and organizational transparency regarding the process, information, roles and responsibilities, decision making and oversight for establishing ETRs
- Revise governance to include a feedback loop to allow for revising and refining ETRs as restoration proceeds

Multiple aspects of the OMS system failed. Although system failures did not impede overall power restoration, the failures did impact downstream processes used to communicate with customers.

Corrective Actions

- Complete thorough analysis of OMS failures and corrective actions to preclude recurrence
- Complete infrastructure (inputs/outputs) review of OMS to improve process/data flow and associated corrective actions
- Perform fully integrated system test of the Customer Outage Reporting and Notification systems
- Complete in-flight project to replace OMS

Customer Outage Reporting and Notification

20170272-DEF-STAFF-POD 1-1-000017

Decision Hierarchy
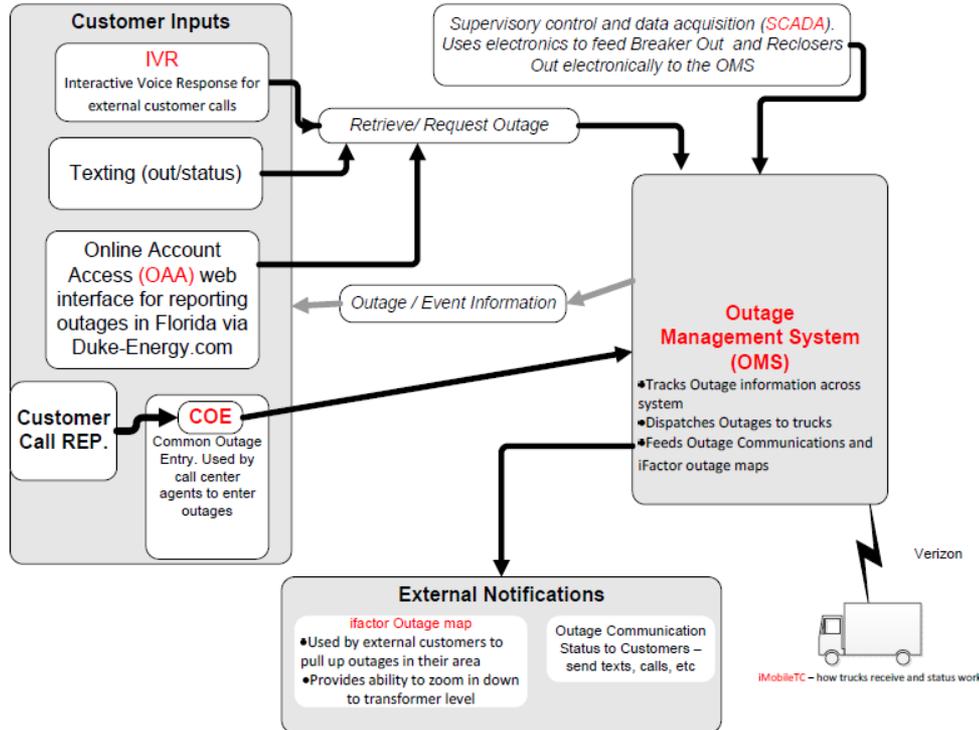
In some cases during the storm event, the decision-making hierarchy structure was unclear. There was some confusion associated with decision/approval authority in certain areas during the storm.

Corrective Actions

- Incorporate Irma experience into Crisis Management Team (CMT) and Incident Support Team (IST) manuals, including revisiting activation criteria for storms and whether approval authority is transferred to these teams when they are fully activated

- For decisions that should be made outside an Incident Management Team (such as billing), determine appropriate governance, including pre-determined decisions

- Develop guidance to ensure clear ownership and authority over all aspects of storm response

- Develop and implement storm response exercises that test all applicable aspects of tool capabilities and ICS implementation

- Develop guidance to ensure executive management is updated with pertinent information in cases when IST and/or CMT are not activated

Customer-facing communications throughout the event were not always effective due to (1) inaccurate ETRs, (2) failures of the OMS and (3) decision-making hierarchy.

Corrective Actions

- Joint Information Center – move key Corporate Communications and Customer Communications personnel to affected jurisdiction
- Develop communications contingencies for technology failures (OMS, phone, website, email, etc.)
- Address performance and capacity issues with duke-energy.com
- Address phone capacity issue for call centers
- Expand the base of pre-designated and pre-trained resources to assist call centers and with social media during storms
- Develop governance with clear roles and responsibilities among corporate communications, customer communications, 1DF, Transmission, Customer Contact Center and ICS/storm center
- Revise pre-storm messaging to influence customer restoration expectations

Social Media – Inbound Conversation Sentiment

Inbound Customer Very Positive vs. Very Negative Share of Voice

Storm Prep = Higher Levels of Good Will

Assessment/Restoration = Negative Backlash

Restored = Good Will Returns

— Thank Yous
— Overtly Negative

Storm hits Florida

ETRs announced

-Missed Pinellas and Pasco County ETRs
- Asked customers to re-report outages

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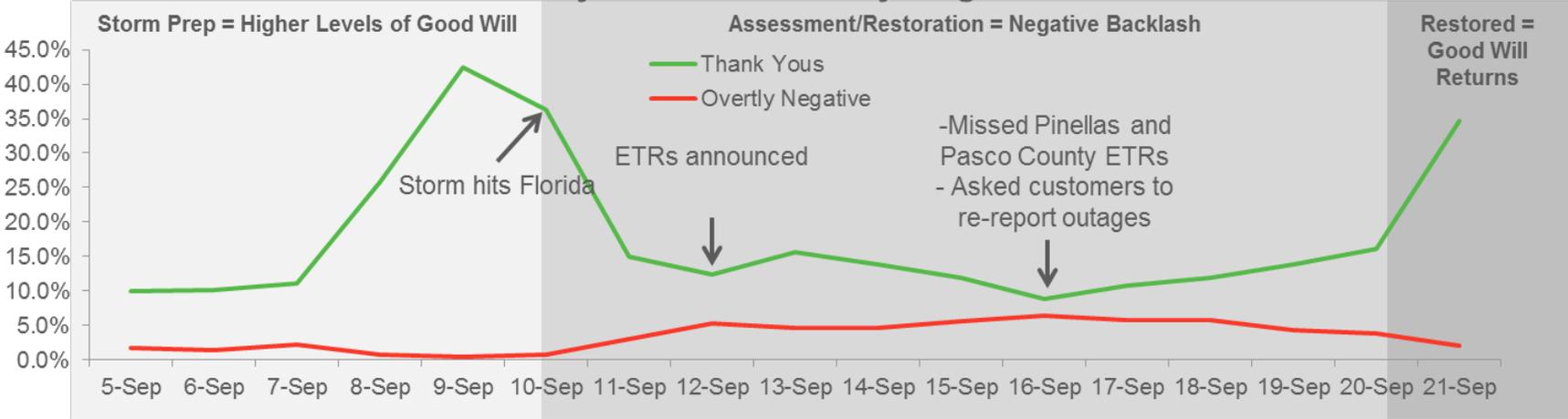
Additional actions to address lessons learned include:

- Develop restoration contingency plans for loss of storm-critical systems
- Improve 'Resource on Demand' tool usage to manage dispatched resources
- Improve logistics for dispatched resources to ensure adequate housing, food, etc. are provided
- Develop plan to support public response entities to provide convenience products like charging stations and heating/cooling for customers in affected areas
- Ensure proper checks and balances exist to prevent incorrect estimated billing, particularly during storm recovery

Corrective Actions

	Corrective Action	Area+	Owner	Due Date	Timing*
1	Revise governance to include more formality regarding the process, information, roles and responsibilities, decision making and oversight for establishing ETRs	ETR	Michael Lewis	12/31/17	I
2	Revise governance to include organizational transparency regarding the process, information, roles and responsibilities, decision making and oversight for establishing ETRs	ETR	Michael Lewis	5/31/18	H
3	Revise governance to include a feedback loop to allow for revising and refining ETRs as restoration proceeds	ETR	Michael Lewis	12/31/17	I
4	Complete thorough analysis of OMS failures and corrective actions to preclude recurrence	OMS	Chris Heck	11/30/17	I
5	Complete infrastructure (inputs/outputs) review of OMS to improve process/data flow and associated corrective actions	OMS	Chris Heck	3/31/18	H
6	Perform fully integrated system test of the Customer Outage Reporting and Notification systems	OMS	Chris Heck	3/31/18	H
7	Complete in-flight project to replace OMS	OMS	Chris Heck	2021	LT

+ ETR – related to Estimated Time of Restoration process; OMS – related to OMS issues; DM – related to decision-making; C – related to Communications; O – other improvement opportunity
* I – before ice storm season (by January 15, 2018); H – before 2018 hurricane season (by June 1, 2018); LT – long term

Corrective Actions

	Corrective Action	Area+	Owner	Due Date	Timing*
8	Develop restoration contingency plans for loss of storm-critical systems and ensure they are rehearsed and exercised	OMS	Michael Lewis	5/31/18	I
9	Incorporate Irma experience into Crisis Management Team (CMT) and Incident Support Team (IST) manuals, including revisiting activation criteria for storms and whether approval authority is transferred to these teams when they are fully activated	DM	Ben Waldrep	3/31/18	I
10	For decisions that should be made outside an Incident Management Team (such as billing), determine appropriate governance, including pre-determined decisions	DM	Ben Waldrep	3/31/18	H
11	Develop guidance to ensure clear ownership and authority over all aspects of storm response	DM	Ben Waldrep	3/31/18	H
12	Develop storm response exercises that test all applicable aspects of tool capabilities and ICS implementation	DM	Ben Waldrep	3/31/18	H
13	Implement storm response exercises that test all applicable aspects of tool capabilities and ICS implementation	DM	Ben Waldrep	5/31/18	H
14	Develop guidance to ensure senior management is updated with pertinent information in cases when IST and/or CMT are not activated	DM	Ben Waldrep	3/31/18	H

Corrective Actions

	Corrective Action	Area+	Owner	Due Date	Timing*
15	Joint Information Center – move key Corporate Communications and Customer Communications personnel to affected jurisdiction	C	Selim Bingol Barbara Higgins	12/31/17	I
16	Develop communications contingencies for technology failures (OMS, phone, website, email, etc.)	C	Gayle Lanier Joni Davis	3/31/18	H
17	Address performance and capacity issues with duke-energy.com	C	Chris Heck	3/31/18	H
18	Address phone capacity issue for call centers	C	Chris Heck	5/31/18	I
19	Expand the base of pre-designated and pre-trained resources to assist call centers during storms.	C	Gayle Lanier	3/31/18	H
20	Develop governance with clear roles and responsibilities among corporate communications, customer communications, 1DF, Transmission, Customer Contact Center and ICS/storm center	C	Selim Bingol Barbara Higgins	11/30/17	I
21	Revise pre-storm messaging to influence customer restoration expectations	C	Selim Bingol	12/31/17	I
22	Expand the base of pre-designated and pre-trained resources to assist with social media response during storms	C	Barbara Higgins	3/31/18	H

Corrective Actions

	Corrective Action	Area+	Owner	Due Date	Timing*
23	Review and determine if the Assess, Isolate, Restore and Document (AIR-D) process is appropriate and applicable to all of 1DF	O	Michael Lewis	1/15/18	I
24	Develop layouts for all templated base camps. Procure Duke owned assets to increase response time for base camp command and control. Continue refining crew support feeding and hotel/bed assignment.	O	Michael Lewis	4/1/18	H
25	Complete the review and updating of standards and contracts for Damage Assessment (DA) resources	O	Michael Lewis	1/15/18	I
26	Improve 'Resource on Demand' tool usage to manage dispatched resources	O	Michael Lewis	3/31/18	H
27	Improve logistics for dispatched resources to ensure adequate housing, food, etc. are provided	O	Michael Lewis	3/31/18	H
28	Develop plan to support public response entities to provide convenience products like charging stations and heating/cooling for customers in affected areas	O	Joni Davis	3/31/18	H
29	Ensure proper checks and balances exist to prevent incorrect estimated billing, particularly during storm recovery	O	Gayle Lanier	3/31/18	H
30	Verify appropriate closure of corrective actions	O	Ben Waldrep	5/31/18	H

Appendix

Chronology

PERCENT OF CUSTOMERS RESTORED

- Initial news release - Urge customers to be prepared
- Florida Distribution IMT activated
- IST partially activated

Irma page created on duke-energy.com and content updated throughout the storm

News Release – Duke mobilizes 7,000 to respond

- Winds peak 7 p.m. Sunday into mid-morning on the 11th
- 11 p.m. – Irma eye is 50 miles east of Tampa
- OMS begins to show data inconsistencies
- Turned status text message to a generic message updated daily (versus providing customer-specific info)

- Noon – ETRs set
- Afternoon – News release with original ETRs goes out
- Same large number of occurrences of OMS data inconsistencies. Continue to work with vendor

- Morning – 550,000 outbound calls to South Coastal (Pinellas/Pasco) verified system still contains inconsistencies (telling customers power is back on when it is not)
- Disabled outbound calls from OMS

- OMS data inconsistency occurrences still exist but continue to decrease
- News release - 1,000,000 customers restored
- 73,000 estimated bills sent out; 15,000 of these estimates were significantly high

- IST deactivated
- Florida Distribution IMT deactivated

100%
99.8%
96%
91%
88%
77%
56%
32%

| Tues 9/5 | Wed 9/6 | Thurs 9/7 | Fri 9/8 | Sat 9/9 | Sun 9/10 | Mon 9/11 | Tues 9/12 | Wed 9/13 | Thurs 9/14 | Fri 9/15 | Sat 9/16 | Sun 9/17 | Mon 9/18 | Tues 9/19 | Wed 9/20 |

News release – Duke prepared, customer information, outage reporting, etc.

News release – Duke projects that outages could exceed 1 million

- Largest occurrences of OMS data inconsistencies; vendor arrives to troubleshoot OMS
- 8 a.m. – IST fully activated
- Noon – CMT activated
- News release – Duke ramps up restoration and damage assessment
- Irma moves out of Florida service area in the afternoon

- Number of OMS data inconsistency occurrences begins to decrease
- News release – 800,000 customers restored
- CMT deactivated

- News release at 11:20 p.m. providing new ETRs for Pinellas and Pasco
- Missed initial ETRs of midnight for Pinellas and Pasco
- Delayed sending estimated bills until the 20th
- IT resets OMS and clears data overnight

- Missed additional original ETRs

All OMS functions re-enabled

LEGEND
OMS issues
Media relations
IMT/IST/CMT
Weather
Customer communications

2017-08-HURR-STAFF-POD-000027

Glossary

Acronym	Full Name	Definition/ Function
CMT	Crisis Management Team	Senior Management Committee activated to quickly and effectively respond to a crisis of severe impact to the enterprise so that the impact on Duke's customers, shareholders, employees, other stakeholders, corporate assets, and corporate reputation is minimized.
COE	Common Outage Entry	Web front end for Call Center agents to enter outages
ETR	Estimated Time of Restoration	A time estimate of power restoration provided to customers and stakeholders
ICS	Incident Command System	A standardized approach to the command, control, and coordination of on-scene incident management, providing a common hierarchy within which personnel from multiple organizations can be effective.
iFactor	Outage Map	Used by external customers to view outages in their area
i/Mobile/TC	Mobile Work System for Florida	How trucks receive and status work
IMT	Incident Management Team	Management of emergency response actions to an incident by site personnel or emergency responders.
IST	Incident Support Team	Centralized emergency management team that both supports activated IMTs through coordination and prioritization and ensures an integrated and comprehensive company response.
IVR	Interactive Voice Response	Allows users to report outage or get outage status via phone
OAA	Online Account Access	WEB interface for reporting an outage for customers in Florida
OMS	Outage Management System	InService from Integraph for Florida
SCADA	Supervisory Control and Data Acquisition	Sends breaker and recloser data to the OMS

20170272-DEF-STAFF-POD 1-1-000028

1DF'S SUMMARY OF RECEIVED COMMENTS FOR HURRICANE IRMA

Positive Comments Received:

1) Written IAP and plans so field personnel can understand what is being planned higher

2) Briefing content/cadence much better than past events. Allowed for more regimented schedule and kept meetings to the time frame scheduled

3) Use of MY WORLD made navigating around the system area much easier, made tracing out circuits easier than using line drawings and provided some outage information not being received due to OMS not fully functioning

5) Continued/"Off-Season" collaboration that occurred between the regional staffs and commands resulted in good working relationships between the ICs and the staff Chiefs had built common methods of doing planning and logistic support so they were able to assist each other. Overall, the continued cross talk between regional staffs and the command level led to each region effectively supporting the overall 1DF plan.

Opportunity Comments Received:

1) Consider streamlining admin procedures and requirements from a logistics standpoint to avoid crews having to leave worksites.

2) A better tool than ROD must be brought into use. There are numerous products that effectively track off system resources, internal resources and make it easier to input crew information to conduct planning.

2) Crew support in the base camps , specifically handing out hotel keys to individual resources is cumbersome..

3) While the senior level of leadership at the Regions had good planning time, too much time was used by the senior staffs. The extra time Regional staffs used meant the less time the front line leaders had to make a plan.

4) The development of the 1DF staff needs more clarity in how it will operate with each region as well as operate with the IST. Clearly define how the 1DF Staff supports the ability of the CDO to make decisions and provide planning guidance and operational planning to the regional staffs.

5) A full time logistics person(s) is needed within the 1DF structure whose main and only focus is the preparing of sites, vendor management, and ramping up staging/base camps for storms. Logistics is a complex orchestration of competing logistics.

6) Preparing current and relevant information for the PIO/LNO structure is critical to informing our customers and government agencies of current work ongoing, locations(s) that work is occurring and providing the best planning information for customers and government agencies to make decisions. The 0700 report must have relevant information that is current as of that day, that the previous day when the IAP was created.

7) Examine the data used in setting ETRs and the process as documented currently. Determine the best sets of data to make decisions from the multiple sets currently available and determine the priority for relying on that data in terms of setting ETRs. Use the data, as well as feedback from the field, to provide a complete as possible "INTEL" picture before making setting final ETRs and releasing public information.

8) All DA personnel, both leadership and support roles, need additional training. OMS & myWorld training and practice sessions addressing all three OMS platforms should be conducted on a recurring, regular basis, and involve C&M leadership, engineering personnel (including leadership) and back office (admin) personnel.

9) Daily work shifts should not be altered unless the restoration has conclusively reached the very last day of activity.

10) Prepare Standard Briefing Formats for all meetings and products produced to the field. The IAP is a great format to focus on future planning and needs, but does not adequately address the daily operational requirements. Focus on more coordinating instructions in an operations plan, a clearly articulated logistics support plan and provide IC intent and purpose.

Other Action Items to Fold into the ERO:

1) Pushing autonomy/control as low as possible so lower levels can operate quicker

2) The coming of ADMS and using the same procedures throughout each region

3) Ensuring that we have adequate manual back-ups in case automation is not available.

4) Develop Family care plans for single parents that remain on file and kept up to date. This not only prepares lineman to deploy quicker, but also helps the leadership should there be a hardship that prevents an employee from being able to get home to their family.

5) Prepare what criteria must be in place and what parameters must be met to set Go/No Go criteria to deploy crews across the system in support of other regions. Ensure there is clearly stated guidance who provides those answers and make sure they are all answered before making final decisions.

6) PIO needs to be used during crew travel so that we can put out good news stories/positive news coverage of our crews deploying.

7) Likewise if PIO is provided a roster of who is traveling and where they are from, that would be very helpful for generating potential media stories.

8) Business Continuity/Contingency Plans need to be revised/updated/created for unexpected happenings such as automation platforms and other relied upon systems not functioning.

9) Crews movements by smaller serials need to be created so that crews move in smaller groups. It makes feeding and fueling easier, especially if relying on commercial support during movements

10) Positioning internal fuel support assets with the travel parties is great and allows fueling to happen quicker

11) Consider whether self-contained teams should be modified or revamped to ensure consistency among regions.

12) Company DA personnel (engineering personnel) should be equipped with smartphones instead of flip phones. Having better technology will provide those doing the DA Surveys greater navigation and communication capabilities and easier exchange of information.

Access to specific information	Hierarchical; small group of individuals, cascading communication which limits speed to market. Work flow is consolidated through single owner (Corp Comm/Ops)	Flatter organizational structure to allow for quick, distributed communication of key facts, with clear accountability for who takes action on what.	Paige Layne/Valerie Patterson & Joni Davis/ Taryn Sims Christine Wyche & Patty Jasper By 11/30/2017	From CEO approving ETOR to publication/communication: 4 ½ hours on 9/12 From approving revised ETORs to publication/communication: 9 hours on 9/17 - Clearly delineate JIC storm roles/responsibilities in our procedures and process manuals to specifically address storm response. - Provide specific checklists for each position to be required for storm response, with an emphasis on fully incorporating Customer Communications organization. - Also, develop a JIC staffing plan that anticipates a multi-day, multi-state response
Message development	Corp Comm drafts press release; all other communication embargoed until press wording and daily key messaging is approved	- Corp Comm drafts positioning and key message points; HR uses to build employee-facing communications; CXT uses to build reactive responses for CCO and social media. Corp Comm drafts press release and updates web assets - Enhance JIC storm roles/responsibilities in our procedures/process manuals to specifically address storm response instead of the current descriptions that more nuclear or all hazards focused. Provide specific checklists for each position to be required for	Tina Worley Mike Keller By 12/31/2017	Positioning, tone and form factor vary greatly between channels. While attention needs to be given to anything that will reside in the public domain, press wording is not well accepted by customers and the current time to complete does not meet customers needs

		storm response. • Implement formal rumor control process for storms similar to the one used for nuclear rumor control, leveraging the same tool. • Partner with technology owners to develop approved transparent messages that can be used when technology fails (storms and normal operations).		
Timely communication	All communication synchronized to be released at time of press release. Approval process is slow with numerous approvers in the chain. Communications that is based on approved key messages must be approved by PIO.	• Customer questions should be answered as soon as answers are known. CCO and social media responders should update responses instantaneously once new information is known • Work within ICS structure to refine how/when approved data is provided to Corporate Communications and to establish processes that enhance information flow across response and oversight organizations (IMT/IST/CMT/JIC, etc.). • Pu a refreshed message on the website every XX hours (recommend every 3 hours at a minimum). • We should develop more robust outage reporting matrix – updated regularly with more data points.	Tina Worley Mike Keller By 12/31/2017	Press release, official website updates should be carefully coordinated. More flexibility is needed within ICS structure for data/information flow and approval. Examples of concerns include: approved information provided once/day, multilayered process for information gathering and approval, etc Even if not much new information, a new time stamp and altered message would make customers feel like we were telling them something. If communications have the essence of key messages, they should not need PIO approval. A SMC representative is now in the approval chain for press releases. Messages have to be tailored to the channel in which they are being used so slight variations in the message should be acceptable and not need further approval. Email approval averages approximately 3-5 hours

				for development, coding to approval. Email on 9/13: 5 hours
Communication channels	Focus on contact center – phone numbers published on press releases, web site, etc.	• Focus on digital/social media - no limit to communication capacity, and much faster transaction time than call center. • Consider adding a form for social media to intake locations of potential damage/customer concerns to deliver to field.	Tim Pettit Brittany DuBose By 11/30/2017	AT&T trunks and web site overwhelmed by volume with repeated capacity issues . Kept pushing customers to overwhelmed channels, degrading performance. Main objective should be to handle customer once, not pass them from channel to channel, handling multiple times. Incorrect information was inadvertently sent to customers because multiple communications systems (IVR status ETRs, outage maps, Proactive Outage information) were all tied to system that was presenting incorrect information, until the issue was realized and corrected.
Physical layout of center	Separate tables, physically proximate but not co-creating content. Tools available within center were different by room (maps, information on white boards, etc) Field command center proximate but not connected to JIC	• Create round table structure with assigned representatives from key functions (press, website, social media, IDF, contact center, SMB, large accounts, HR) • Provide automated display of what customers are seeing on our website as well as on Facebook. • Eventually, some kind of data trend display on a TV would be helpful…highest number of repeat words per hour on social media hits (eg restoration time, slow systems, etc). Number of social media hits per hour versus calls, number of hits to webpage etc	Selim Bingol/DCC leader (Jeff Corbett?) By Q1 2018	Physical co-location and co-creation will increase speed to end product. It would help provide the context for the customer comments we are getting and would also be a way to keep focus on providing timely updates to our websites and social media presence. Contact centers generally have information boards highlighting volume and key statistics. Emulate an operating environment in the JIC.

Physical location of resources	Maintained communications resources centrally in the JIC	Update CC storm process to establish a "forward JIC" by moving a core team of Corp Comm leaders to the affected region to provide oversight and guidance when a major storm will affect jurisdictions outside of the Carolinas	Selim Bingol By TBD	
Process	We asked customers to report outages and relied on OMS to see whether outages had been previously reported or not. Customers provided very individual information that may have been useful to the field – what process can we use to not have the customer contact us again? Specific issues were sent to "ICanHelp" – was that the right location?	• In catastrophic situations, should waive the need to report and immediately communicate on web, IVR and social media. Once restoration has matured, can then implement requirement for reporting. • Need specific connection to the DCC and Revenue Services for up to the minute decisions and to think through implications of process changes	Michael Lewis State Presidents By TBD	Need to determine thresholds to activate plan. Increased call volume because customers felt they needed to report the outage. JIC has direct connection to the DCC – what can the social media team do to leverage this?
Role clarity and chain of command	Multiple individuals from same organization resulting in concentrated staffing. Multiple individuals weighing in on what should be communicated and where (eg, "rumors" or "scam warnings")	• Re-evaluate staffing needs and develop bench strength for major/multi-jurisdictional storm response and events that could last for extended periods. • Assign single representation from leadership level for each function and rotate every 6 – 8 hours to remain fresh. Clear accountability should be established to control what is said to employees (HR), press media (Corp Comm) and customers (social media, CCO)	Selim Bingol/Jeff Corbett By 1/30/18	Would allow for continuous coverage or extended coverage, as well as ensure refreshed and well rested staff. Clear accountability could control strategy for what Duke communicates vs what other local authorities should handle (eg, FEMA and rumor control: https://www.fema.gov/hurricane-irma-rumor-control) Both departments should refine their respective response plans to incorporate lessons learned from Irma and to ensure the purpose, strategy, goals, objectives,

			general tactics and channels are clearly stated and complementary. This communication plan is shared with key internal stakeholders/departments
Technical capacity	Finite set trunk capacity at contact center; web page view limitations; limited to 20 concurrent responders on social media Technology issues from OMS, web, IVR, Proactive outage service made it very difficult to navigate communications.	• Create increased capacity during emergency situations – increase trunk capacity at contact center to handle 20,000 (vs 10,000) concurrent calls; increase web views from 7.000 to 20,000 or more; increase Sprinklr license capacity to 50 concurrent users from 20. • Need ability to test communications capability in each jurisdiction. • Formalize Web Support Plan - Formalize plan for when to move web platform to other companies for support ahead of projected high use times. • Determine the back-up plans for any channels that have technical issues. Define roles for Tech Support and IT to provide early indicators of channel failures and full architecture of how each channel is configured. Develop contingency plans by channel and across channels • Improved training and development of downtime and manual processes. Identify critical systems: OMS, CIS, COE, IVR, proactive notification, web site, iFactor maps, mobile • Need centralized dashboard	Gayle Lanier, Joni Davis, Patty Jasper By Q1 2018	While we would prefer to channel customers to our internal assets, they failed us during the initial storm and response periods. Improvement in the capacity of all channels is required, as is a clear strategy across channels. Need to develop robust business continuity plans in the event of channel service degradation or failure

		showing what systems are up and what systems are down per region, similar to what was created on white board.		

Customer support plan	Did not have specific focus on customers beyond customer-facing communication channels (including social media)	• For extended outages, provide local access for customers in affected areas supporting customer needs:
		  o Charging stations for electronic devices
		  o Cooling or heating stations
		• Determine key trigger points to stand up relief efforts
		• Partner with large customers whose footprint spans service territories (eg, Publix, Wal-Mart); invest in capabilities within retail space vs standalone mobile units
		• All customer communication channels under oversight of Customer Engagement team
			Joni Davis
			Q1 2018
				Need to work with C&I business team to develop approach to work with large customers

FL ICS Liaison and PIO Section Corrective Actions

Action by Section	Owner	Additional Notes	Status	Alignment with ECA	Key Collaborative Internal Partners
Liaison – Melissa Seixas					
1. Increase EOC staffing by 12 resources and provide training	Palomar-Walsh	Expands coverage of county EOCs to ensure support for system-wide event (35 counties)	Underway	NA	• Emergency Mgr • CRM • LAM • Various depts
2. Increase EOC overnight phone support by 5 resources and provide training	Palomar-Walsh	Expands resources to ensure 24 hour support of county EOCs	Underway	NA	• Emergency Mgr • Various depts
3. Increase Op Center Liaisons (OCLS) staffing by 10 resources	Palomar-Walsh	Adds depth for shifts and extended day restorations	Underway	NA	• Emergency Mgr • Distribution
4. Create new admin support role for OCLs and staff with 10 resources; provide training	Palomar-Walsh	Intended to offload admin support from OC	Underway	NA	• Emergency Mgr • Various depts
5. Further develop road clearing processes (both admin and field ops processes)	Goldsmith/Seixas	Needed to meet increasing county expectations on road clearing support	Underway	NA	• Distribution Contract Resources Mgr • Emergency Mrg
6. Simplify the road clearing process and differentiate among wire down and other EOC priorities (critical customers)	Guzman/Stagg	Make It Safe terminology caused confusion with external partners	Underway	NA	• Distribution Contract Resources Mgr • Emergency Mgr
7. Identify and implement communication processes between op centers and transmission org	O'Keefe	Improved communication with transmission group	Completed	NA	Transmission
8. Identify and implement communication methods for specific needs of EOC reps and OCLs	Seixas		Underway	NA	• Corp Comm • Distribution
9. Train state EOC reps on use of Issues Tracker	Palomar-Walsh		Underway	NA	• State Public Affairs
10. Identify and implement process for critical customer list review by county EOCs	Guzman/Arroyo		Underway	NA	
				NA	

By Seixas, Melissa L. • June 28, 2018

Emergency Response Roles & Responsibilities

DRAFT

October 12,2017

Emergency Response Structure

Partial structure shown; refer to PIO for full Corporate Communications plan

Corporate Communications *General Storm Response Communication Plan*

20170272-DEF-STAFF-POD 1-1-000041

DRAFT

Storm Levels*/ Comm Strategy	RECOMMENDED Comm. Tactics / Channels

LEVEL 0* ETR < 6 hours **REACTIVE** → Normal Operations

LEVEL 1 – 2* ETR 6 – 24 hours **REACTIVE** → Normal Operations, plus awareness call with call with key Joint Information Center leads

LEVEL 3* ETR 24 - 48 hours **PROACTIVE** Activate Joint Information System (JIS) →
- External Media Outreach
- Social Media
- Website updates
- ELT Update
- Crews for visuals
- Medical Alert Calls

LEVEL 3* ETR > 48 hours Multiple Zones **PROACTIVE** Joint Information Center (JIC) →
- External Media Outreach
- Social Media
- Website updates
- ELT Updates
- Crews for visuals
- Advertising
- PSAs
- Philanthropy / Donations
- Embed Corp. Comm
- Embed media
- Videos / Pictures
- Spanish-Language Outreach
- Bill Inserts (i.e., for thank you)

Severe Weather event forecasted

Has IDF scheduled a pre-event Call? — Yes → Pubic Information Officer role activated; Joint Information System / Center activated

No → Regional PIO gathers data from multiple sources

Is there high confidence damage / power outages will occur? — Yes → Potential Storm Impacts

No → Regional teams / corp. comm. duty person handles

- Duke Energy Meteorologists
- 1DF leads (Tripp, Ordaz, Fowler)
- Call Center
- Media Duty Person
- Regional Communicators
- District / Community Relation Managers
- others?

EXIT

Event concludes; outages restored; waning media / customer interest

What's happening?

Conditions change; ETRs extended or missed; media interest continues

REPEAT

Storm levels are defined by 1DF Incident Command Structure

Originally Developed 2011; Revised Sept 2017

3

Customer Experience *General Storm Response Communication Plan*

20170272-DEF-STAFF-POD 1-1-000042

DRAFT

Storm Levels*/ Comm Strategy	RECOMMENDED Comm. Tactics / Channels
LEVEL 0* ETR < 6 hours **REACTIVE**	Normal Operations
LEVEL 1 – 2* ETR 6 – 24 hours **REACTIVE**	Normal Operations, plus awareness call with call with key Joint Information Center leads
LEVEL 3* ETR 24 - 36 hours **PROACTIVE** Activate Joint Information System (JIS)	• Social Media response • Website updates • CSC / DM / LBC Messages • Customer emails
LEVEL 3* ETR 36 - 48 hours **PROACTIVE** Joint Information Center (JIC)	• Customer process – what do customers need to do? • Social Media response • Website updates • CSC / DM / LBC Messages • Customer emails
LEVEL 3* ETR > 48 hours Multiple Zones **PROACTIVE** Joint Information Center (JIC)	• Customer processes – what do customers need to do? • Customer Goodwill plan facilitation • Social Media response • Website updates • Storm page / dark site customer content • CSC / DM / LBC Messages • Medical / Other Outbound Calls • Customer emails • IVR Messaging • Customer support plan (power charging, heating or cooling) • Customer thank you post-event

Severe Weather event forecasted

Has IDF scheduled a pre-event Call?
- Yes → Pubic Information Officer role activated; Joint Information System / Center activated
- No → Regional PIO gathers data from multiple sources

Is there high confidence damage / power outages will occur?
- Yes → Potential Storm Impacts
- No → Regional teams / corp. comm. duty person handles

Regional PIO gathers data from multiple sources:
- Duke Energy Meteorologists
- 1DF leads (Tripp, Ordaz, Fowler)
- Call Center
- Media Duty Person
- Regional Communicators
- District / Community Relation Managers
- others?

EXIT

Event concludes; outages restored; waning media / customer interest

What's happening?

Conditions change; ETRs extended or missed; media/customer interest continues

REPEAT

Storm levels are defined by 1DF Incident Command Structure

10/12/2017

4

DRAFT

Storm Levels*/ Comm Strategy	RECOMMENDED Comm. Tactics / Channels

EXIT

LEVEL 0*
ETR < 6 hours
REACTIVE

Normal Operations

LEVEL 1 – 2*
ETR 6 – 24 hours
REACTIVE

Normal Operations, plus awareness call with call with key Joint Information Center leads

Event concludes; outages restored; waning media / customer interest

Pubic Information Officer role activated; Joint Information System / Center activated

Severe Weather event forecasted

Has IDF scheduled a pre-event Call?

Yes

No

Is there high confidence damage / power outages will occur?

Yes

No

Potential Storm Impacts

Yes

LEVEL 3*
ETR 24 - 48 hours
PROACTIVE
Activate Joint Information System (JIS)

- Staffing plans
- Overtime plan

What's happening?

Regional PIO gathers data from multiple sources

Regional teams / corp. comm. duty person handles

LEVEL 3*
ETR > 48 hours
Multiple Zones
PROACTIVE
Joint Information Center (JIC)

- Employee Messages (WNA)
- Payment and work hour clarification
- Employee policy communication
- Post-event thank you

Conditions change; ETRs extended or missed; media/ customer/ employee feedback

- Duke Energy Meteorologists
- 1DF leads (Tripp, Ordaz, Fowler)
- Call Center
- Media Duty Person
- Regional Communicators
- District / Community Relation Managers
- others?

REPEAT

DUKE ENERGY

"Customer" Role Definitions:

- **Customer Lead**: Works in concert with the Public Information Officer. Responsible for customer response and development of customer communications based on the storm communications strategy and approved messaging. Leads message synchronization and cadence for direct to customer comms to ensure timely and accurate information in the appropriate channel(s). Activates channel contingency plans in the event of technology issues; oversees customer experience during an event and coordinates with customer care organization and revenue services on policy adjustments and/or support plans needed.

- **Channel Integrator**: Develops and ensures delivery of integrated customer messages across channels (web, email, outbound call scripts, text, etc); understands which channels available to communicate in the event of technology issues and integrates status with customer care organization.

- **Customer Service Center (CCO) Liaison**: Partners with CCO event communications team to share key messages from Joint Information Center with CS specialists and volunteers. Captures rumors and customer needs for key message development.

- **Channel Technical Liaison**: Liaison between IT and Customer Lead/Channel Integrator to provide updates on channel performance and technology issues. Provides real time system updates for Customer Lead/Channel Integrator to more rapidly prepare messaging; enable contingency plans; bring channels back to service.

- **Social Media Customer Care**: Triages and directs inbound social media inquiries to social media storm volunteers. Works closely with JIC social media team and CCO social media to share messages and respond to customers who are engaging in this channel.

- ****Channel Event Manager**: TBD – would activate this role in failure of numerous channels; responsible for working closely with Customer Lead/Channel Integrator to facilitate calls between IT/CCO and other stakeholders to bring channels back to service.

Org chart (Charlotte-based JIC):

- Lead PIO
  - Emergency Planner/JIC
    - Message Integrator/Info Lead
      - Media Liaisons
      - Social Media Liaisons (Corp)
    - Customer Lead
      - Channel Integrator
      - Cust Svc Liaison — CCO event Comms team
      - Channel Technical Liaison — I/T War Room
      - Social Media Customer Care
      - *Channel Event Manager
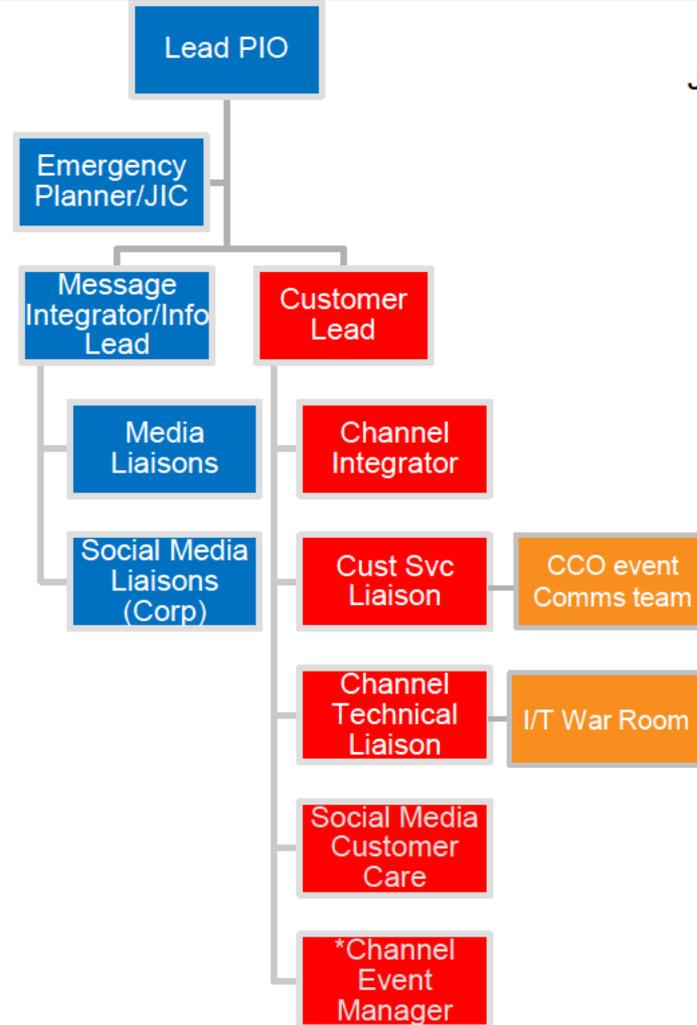
JIC Forward (Regional JIC)

- Lead PIO
  - Region Customer Lead/Ch Integrator
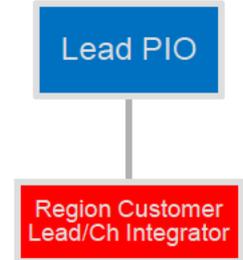
JIC Forward: When the PIO moves to manage the storm on a regional level; the customer experience team member travels to coordinate with PIO. In this regional model, a customer lead/integrator will be "on the ground" to lead these two roles with **direct support** from the core customer team in the Charlotte-based JIC.

20170272-DEF-STAFF-POD 1-1-000044

DUKE ENERGY®

Customer Roles -- Assigned Team Members who can serve in these roles

- Customer Lead: Joni Davis, Taryn Sims, Brittany DuBose

- Channel Integrator: Mike Keller, Laura Price, Stephanie Tucker

  - Regional Customer Lead/Channel Integrator:
    (Carolinas) Mike Keller, Laura Price
    (Midwest) Terry Heath, Laura Price, Nancy White
    (Florida) Mike Keller, Lola Stein, Will Rodgers

- Customer Service Center (CCO) Liaison: Stephanie Tucker; Laura Price, Gwen McCarthy

- Channel Technical Liaison: Meko Hunter, Tia Huff, Jeff Barnett

- Social Media Customer Care: Brittany DuBose; Maddy Piercy, Jake Hill

- **Channel Event Manager: Paul Watkins, Scott Abbott

**For nuclear drills – the CCO Liaison and Social Media Customer Care roles are staffed to participate on behalf of customer experience.

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IT Application Portfolio
OMS (Outage Management System)   • OMS Florida – InService is the product and Intergraph is the vendor   • OMS Carolinas - CADDOPS   • Carolina West and Midwest - DOMS   • Tracks Outage information across system   • Rolls up outage information to highest level common component   • Dispatches Outages to trucks   • Feeds Outage Communications and iFactor outage maps
COE (Common Outage Entry)   • Web front end for call center to enter outages
iFactor Outage Map   • Used by external customers to pull up outages in their area   • Provides ability to zoom in down to transformer level
Outage Communications Broker   • Provides call back to customers with update information related to reported outages.
IVR (Interactive Voice Response)   • Handles largest percentage of outage reporting volume   • Allows customer to check status of a reported outage
i/Dispatcher   • Used by DCC to dispatch/disperse work to trucks in Florida
i/Mobile/TC (Fla Only)   • How trucks receive and status work
OLS (Online Services)   • WEB interface for reporting an outage for customers in the Carolinas and Midwest   OAA (Online Account Access)   • WEB interface for reporting an outage for customers in Florida
SwampFox   • Outbound Communication Manager   • Manages templates for voice, text, and email communications
Acronyms: ITR – Initial Time of Restoration   ETR – Estimated Time Restoration

Timeline of Service Disruption Events (SDE)
September

Sunday 10th Irma strikes Florida	Monday 11th	Tuesday 12th	Wednesday 13th	Thursday 14th	Friday 15th	Saturday 16th	Sunday 17th	Monday 18th	Tuesday 19th
OMS Data Distribution Control Center (DCC) provides example of outages that cannot be closed due to Outage Management System (OMS) error.	IT and Vendor work on how to resolve the OMS error message as a result of how the modeling was performed.	IT working to understand why outages are not rolling to breakers. Continued work with the vendor to see how to clean up outages affected by modeling. Numbers on OMS status are not changing based on feeders being closed in the field.	After most crews shut down for the day, tried to clear 10,000 rows from the OMS system, however system would only allow 200. Continued work the vendor to see how to clean up outages affected by modeling.	Continued to work on resolving OMS data issues.	Cleared Zephyrhills data from OMS and began dispatching to Zephyrhills as an OMS event. Overnight cleared all data from OMS.	OMS repopulated from customer calls	Work to close outages in the field catching up to back office updates.	Validate numbers in OMS status	Continued to check calls from customer against calls in OMS sytstem.

SDE 1 (7:13PM to 3:02AM – 8 hours) All jurisdictions Online Services (OLS) and Common Outage Entry (COE) slowness – All systems impacted which initiate outage requests (e.g. Interactive Voice Response (IVR), OLS, COE)

SDE 2 (9:09AM to 1:00PM – 28 hours) – Slow response with duke-energy.com – Internal and external customer cannot access the Duke-Energy home page or outage page.

SDE 3 (9:52AM to 9:59PM – 12 hours) – DEF Kathleen substation down – Loss visibility to Telecom field assets. 81 SCADA RTU sites and 19 radio sites

SDE 5 (9:18AM to 12:30PM – 3 hours) – OLS login issues observed – Customers could not report outages via WEB

SDE 4 (3:30PM to 8:30AM – 89 hours) – OMS active transformer out process is failing – Outage map was incorrect for FL

SDE 6 (6:42 AM to 5:43 PM – 11 hours) – Florida OMS is Auto generating initial Time of Restoration (ITRs) – Customers were given incorrect ITRs

SDE 7 (9:40AM to 10:28AM - <1 hour) – OLS login issues observed – Customers could not report outages via WEB

SDE 8 (11:02AM to 11:35AM – 25 hours) – DEF COE Outage Ticket History missing – Call Center agents could not view ticket history in COE at times for previously reported outages.

SDE 9 (11:35AM to 2:55PM – 3 hours) – Duke Energy Florida (DEF) Bayside voice is down- internal business calls could not be completed at Bayside nor could the Public Service Commission (PSC) reach that center. Incoming customer calls were not affected.

SDE 10 (5:42AM to 7:30AM – 2 hours) – DEF users unable to access I/Mobile TC – Field Technicians unable to access I/ Mobile TC.

Determination being made of how to deal with customer bills.

SDE 11 (1:00PM to 4:30PM – 25 hours) – DEF OMS DB Copy issue causing slowness – Impacted OMS reporting capabilities

SDE 12 (6:15AM to 8:30AM – 2 hours) – OLS login issues observed – Customers could not report outages via WEB

SDE 13 (3:50PM to 11:04PM – 7 hours) – DEP DEF GIS not available for Geographical info – Eastern Carolinas DEP and Florida DEF do not have Geographical Information Systems available for locating physical elements such as substations, power poles, buildings.

Legend:
OSM SDE's
All Other SDE's

Questions we asked ourselves during this assessment.

- What things went well?
- Were the systems current on patches/fixes?
- Did we have the appropriate level of resources?
- Did we have disciplined "change control" in place?
- Are the Business Continuity Plans sufficient?
- Did we track and complete prior lessons learned?
- Were we efficient in how we deployed resources across different structures (IST, IT "war room", Distribution IMT's, DCC, etc.)
- Are our systems sized for a full volume outage event?
- Which IT systems did not perform as expected and why?
- How do our IT systems interact with one another?
- How did we lose confidence in the Outage Management System data?
- How did not having accurate outage data impact communicating to our customers?
- Where did we experience a lack of clarity around decision owners?

STORM Ogranization: Information Technology Systems

	Hurricane/System Name: 2017 Irma
	What went well
Item 1	Good collaboration across IT and business
Item 2	IT War Room call – provided good central source of needed resources
Item 3	IT having a physical presence at business locations (IT CIO - at ground zero)
Item 4	Telecomm Switch and IVR performed well; design allowed us to enable and disable functions in a timely fashion per Customer requests
Item 5	Early during storm an option was put up front on IVR enabling customer to speak with rep quicker
Item 6	CIO Update – daily scheduled mtgs
Item 7	CIO Staff dispersed to different war rooms
Item 8	CA APM (Wylie) – centralized monitoring – dashboard helped with troubleshooting
Item 9	Lessons Learned from Hurricane Matthew – that were applied – made systems better (all high value items have been implemented)
Item 10	Pre-meeting (proactive call) looked at all systems and prepped systems
Item 11	75 changes made to these systems between Matthew and IRMA - improved performance
Item 12	Pre-meeting with IT and the business prior to the storm
Item 13	Agile changes made right before the storm
Item 14	More than 1 million inbound communications received – much larger than ever before in Fla. –systems performed well to handle the volume
Item 15	Increased usage of texting capability for our customers utilized --- provided 114K outbound texts
Item 16	HP practices during trouble-shooting (enabled us to get changes correct on first pass)
Item 17	Corp Comm staff co-located with DCC and ICS leadership
Item 18	Utilization of resources across all Jurisdictions (including vendors) - Leveraged resources from all jurisdictions & Piedmont to support Fla.
Item 19	1600 specialists (CSC Employees only)handling calls – largest number ever
Item 20	More than 500K customers able to speak with rep (if they chose to)
Item 21	Largest number of corporate volunteers ever
Item 22	OMS Vendor support engaged and readily available (24 x7) throughout the storm
Item 23	21st Century handled more volume than ever – without issue (inbound and outbound)
Item 24	Every Florida phone number was redirected to IVR

	Outage Management Systems (OMS) Improvements				
	Identified Gap	**Owner**	**Actions**	**ST or LT**	**Completion**
Item 1	OLS and COE slowness	Patty Jasper	Improve error messages for transactions that timed out.	ST	12/31/2017
Item 2	OMS Active Transformer Out process not completing - Ifactor outage maps and Outage communications were not accurate	Patty Jasper/ DT Thomas / Steve Neglia (Reliability Team)	Review the architecture of the integration between the OMS and Ifactor and Outage Communications system. Provide recommendation on changes to improve data flow and processing	LT	3/31/2018
Item 3	Data integrity issue with OMS data	Jane Brown	Work with business and vendor to fully understand the process that should be used to prepare the system for Damage Assessment. Install new version of Integraph software that has a fix for the bug that was found around "Prefer Job" processing.	ST	12/31/2017
Item 4	ensure work done on paper is updated to the OMS system on a daily basis.	Jane Brown	Work with the business to ensure outages restorations are captured and updated in a timely manner when being done via paper.	LT	3/31/2018
Item 5	Call center agents not seeing outage history for some customers	Patty Jasper/ DT Thomas / Steve Neglia (Reliability Team)	Re-architect the integration between the backend entry systems and OMS. Improve error messaging for transactions that timed out.	LT	3/31/2018
Item 7	Florida OMS autogenerating incorrect ITR's	Jane Brown	Implement Intergraph provided software patch for the OMS to fix the ability to turn off IVRs	ST	11/30/2017
Item 8	Florida OMS autogenerating incorrect ITR's (continued)	Jane Brown	Verify functionality exist to turn off ITRs in CADOPS in Car-East	ST	11/30/2017
Item 9	Florida OMS autogenerating incorrect ITR's (continued)	Jane Brown	Verify functionality to turn off ITRs in DOMS in Car-West/Mid-West	ST	11/30/2017
Item 10	Florida OMS autogenerating incorrect ITR's (continued)	Patty Jasper	Provide Sustainability team a requirement to provide a feature to manage the ability to not pass ITRs to all channels	ST	11/30/2017

	Identified Gap	Owner	Actions	ST or LT	Completion
Item 11	Based on the item above. Disabled config table in IVR (for Fla customers [based on phone # customer calls]. Removed the DNIS overrides to keep customers from hearing or seeing the system-generated ITRs from the Florida OMS system.	Jane Brown	Need to capture this as a work around until the fix for the bug in the above item is provided by the vendor	ST	12/31/2017
Item 12	DEF OMS DB Copy Issue causing slowness - storm reporting metrics were negatively affected	Patty Jasper/ DT Thomas / Steve Neglia (Reliability Team)	Re-architect the copying of data to the non-realtime OMS database so that future issues will not be seen during high volume outage conditions	LT	3/31/2018
Item 13	Lack of DBA knowledge specific to OMS	Jane Brown	Dedicated DBA for all OMS's. Durable team concept	ST	12/31/2017
Duke-Energy.com Improvements					
	Identified Gap	**Owner**	**Actions**	**ST or LT**	**Completion**
Item 1	Sitecore code	Richard Donaldson /Michelle Littlejohn	Modify Site Header: • Rework page layout, Refactor Navigation in stages, Reduce jurisdiction checks • Refactor CustomTokenManager to remove thread locking • Change renderings to AJAX on My Account page • Reduce usage of StringBuilder & String.Compare • Eliminate passing arrays as parameters (use arrays in method only)	ST	3/31/2018
Item 2	Sitecore configuration tuning	Richard Donaldson /Michelle Littlejohn	Change thread timeout setting from 600 seconds to 60 seconds. Modify cache sizing and usage to avoid large instances of trash collection	ST	12/31/2017
Item 3	Environmental	Patty Jasper / Keith Jenkins	Enable X-Forward-By on production servers to allow for logging of visitor IP address. Complete smart health checking functionality and run performance testing on solution (current backlog task already)	ST	12/31/2017
Item 4	Storm Mode	Richard Donaldson /Michelle Littlejohn	Automated & manual switchover. Jurisdictional trigger. Content & layout changes to improve speed & provide better customer experience	LT	6/30/2018
Item 5	Monitoring, Logging & Analysis	Patty Jasper / Keith Jenkins	Reexamine advanced health monitoring and alerting through Introscope and other standard tools. Further explore capabilities of CA APM Team Center and establish regular use. Leveraging code analysis tools during development process. Validate adequate logging and monitoring of all devices	ST	12/31/2017
Item 6	Sitecore Upgrade	Richard Donaldson /Michelle Littlejohn	Perform the upgrade. Replace GSA(Google Search Appliance) with Coveo (or selected search tool). Research CDN (Content Delivery Network).	LT	12/31/2018
Item 7	Other Performance Tuning Opportunities	Patty Jasper	Carbon Black threat management – how the solution impacts CDP. OMS relationships.	LT	6/30/2018
Online Services (OLS) Improvements					
	Identified Gap	**Owner**	**Actions**	**ST or LT**	**Completion**

	Identified Gap	Owner	Actions	ST or LT	Completion
Item 1	use of tools for queries	Patty Jasper	Use of the query hint "OPTIMIZE FOR UNKNOWN"	ST	11/30/2017
Item 2	use of complicated queries in OLS	Patty Jasper	Rewrite the query to simplify it so that the SQL Server Query Optimizer can do a better job.	ST	11/30/2017
Item 3	Query performance	Patty Jasper	Use batch process or SQL stored procedure to create a pre-populated view of the data request so that OLS can perform a simple query to select from a single view.	LT	2/28/2018
Telecomm Improvements					
	Identified Gap	**Owner**	**Actions**	**ST or LT**	**Completion**
Item 1	Customers were calling leveraging legacy lines	Frank Cook	Implement a redundant solution for all toll free numbers and decommission the local numbers 407 (Lake Mary) and 727 (Bayside)	LT	3/31/2018
Item 2	Carrier lines were full	Frank Cook	Investigate how to grow capacity on demand	LT	3/31/2018
Item 3	Design of the Florida trunk lines	Frank Cook	Redesign the Florida trunk lines	LT	3/31/2018
Item 4	Documentation for the direct connection of the Florida Utility Commision phone line	Frank Cook	A process document should be created to describe steps that should be taken to redirect the Florida Utility Commission toll free number to another location in the event of a service interruption. Voice and Data Delivery support staff should be trained on the contents of the document and where it can be retrieved.	ST	10/27/2017
Item 5	Re-direction of the commission phone line	Frank Cook	Implement methods to automatically redirect the Florida Utility Commission toll free number to another location in the event of a service interruption.	ST	1/2/2018
Item 6	Alarms cleared for power outage without the power being restored.	Frank Cook	Per recommendations from the Vendor, additional memory should be purchased and installed for the Telenium network monitoring system. Furthermore, the system should be audited by the manufacturer and recommendations made to ensure that it is sufficiently sized to handle peak demands during significant storm events.	ST	11/27/2017
Item 7	Power lost at telecommunications hub. Power fed by local Co-op.	Frank Cook	A request should be made to the Transmission organization to have a Duke Energy transformer installed at the Kathleen substation to provide power to Duke Energy's equipment.	ST	11/27/2017
Item 8	Power lost at telecommunications hub	Frank Cook	An alternative power source (i.e. generator) should be purchased and installed at the Kathleen location to provide power to mission critical Duke Energy equipment during extended power outages.	LT	4/27/2018
Change Process Improvements					
	Identified Gap	**Owner**	**Actions**	**ST or LT**	**Completion**

Item 1	Change made under service request and not Change Request	Frank Cook	Conduct a review of the IT Change Management policy and set expectations with staff to ensure clarity regarding 1) appropriate use of Service Request verses Standard and/or Emergency changes, 2) Risk Levels of Changes, 3) distinct change records for different environments,)	LT	3/31/2018
Item 2	Change request lists does not include changes that span across days	Frank Cook	Implement steps in the daily IT War Room bridge process for the designated lead to review all changes scheduled within the 24 hour period (should include changes which span the window as well as those which start/end within the window).	ST	12/29/2017
Item 3	Daily review of IT changes scheduled during storms	Frank Cook	Evaluate change management process as it relates to Storm Prep and Storm mode to add rigor to criteria for extracting changes for review. Extracts should include changes that occur during next 7 days as well as those risk level 3 or above changes which span the 7 day window.	ST	12/29/2017
Item 4	accuracy of evaluation of impact of changes	Frank Cook	Conduct an assessment of the IT Organization's understanding of the change and configuration management processes around effective impact analysis. Identify and document gaps / deficiencies which contribute to incomplete/ineffective impact analysis. This evaluation / assessment should include areas such as the discovery process for CIs as well as the mapping process.	LT	1/5/2018
Item 5	implementation of assessment	Frank Cook	Develop plan and implement identified improvements from the assessment in the item above to close gaps / deficiency and aid in further maturing the configuration management process, specifically around effective impact analysis.	LT	3/15/2018

Other SDE During Storm Improvements					
	Identified Gap	Owner	Actions	ST or LT	Completion
Item 1	Unable to access i/Mobile TC	Jane Brown	Determine if can monitor I/Mobile connection to detect need to restart services. Determine if vendor has fixed the issue.	ST	12/31/2017
Item 2	Unable to logon to SS9	Patty Jasper	Implement monitoring to detect ldap corruption.	ST	12/31/2017

IT War Room Improvements					
	Identified Gap	Owner	Actions	ST or LT	Completion
Item 1	One leader for the room.	Frank Cook	Have designated lead on each shift.	ST	12/31/2017
Item 2	Should be the entry point and dispatching point of elevated IT issues	Frank Cook	Process defined to elevate and track issues	ST	12/31/2017
Item 3	Use of conference bridges in the room	Frank Cook	Conf. bridge – need to separate business discussions from IT Technical discussions	ST	12/31/2017
Item 4	Storm Dashboards	Frank Cook	Improve the storm monitoring Dashboard	ST	12/31/2017
Item 5	Be more proactive	Frank Cook	Define health checks, monitor for long running queries, etc	ST	12/31/2017

Item 6	Improve troubleshooting and support in the room	Frank Cook	Have pre-mapped diagrams for troubleshooting available in room. Also ensure that knowledgeable resources are in the room.	ST	12/31/2017
Item 7	Limited number of knowledgable folks (IT and Business) of the systems	Frank Cook	Increase bench strength (IT and business) for systems across the board	ST	12/31/2017
Item 8	Location of IT folks in the storm	Frank Cook	Have support teams in War room and IT SME's in the field	ST	12/31/2017
Item 9	Use of external bridge lines during the storm is confusing	Frank Cook	Clarify that the bridge for the War room is an external bridge line not the Duke internal line	ST	12/31/2017
Item 10	Simplify call in process for scheduled storm updates	Frank Cook	Add one touch sequence to daily calls to help for folks calling in from cell phones	ST	12/31/2017
Item 11	Lack of formal turnover process for shift change	Frank Cook	Need formal turnover process for each shift	ST	12/31/2017
Item 12	Unclear of exit criteria and return to normal operation	Frank Cook	Need clear exit criteria and return to normal operations	ST	12/31/2017
Integrated Testing Improvements					
	Identified Gap	**Owner**	**Actions**	**ST or LT**	**Completion**
Item 1	Integrated system testing scope	Richard Donaldson	Scope of test needs to be: Blue Sky for baseload, largest storm to date and 100% system outage	LT	3/31/2018
Item 2	Shared infrastucture	Richard Donaldson	Need to account for business processes that would stress shared infrastructure in normal operation jurisdicitions while storm happeningin others. For example finance doing month end close while storm happening.	LT	3/31/2018
Item 3	Antiquated data in QA and test systems	Richard Donaldson	Ensure a periodic data refresh is done as a part of comprehensive testing.	LT	3/31/2018
Architecture/System Improvements					
	Identified Gap	**Owner**	**Actions**	**ST or LT**	**Completion**
Item 1	Consistent data flow to meet customer needs	Patty Jasper/ DT Thomas / Steve Neglia (Reliability Team)	Review OMS data architecture to ensure consistent flow of data to meet customer needs. Review to include but not limited to: Infrastructure design and CPU. Need to ensure all 4 OMS systems in the review.	LT	3/31/2018
Item 2	OMS architectue to support near real time	Patty Jasper/ DT Thomas / Steve Neglia (Reliability Team)	Review integrated OMS architecture and modify to support real-time or near real time access for peripheral applications including Transformer file performance, iFactor, COE, EOC Reporting and Maps, Mobile Outage Reporting, Proactive Outage notification, DBCOPY/Archive, IVR/ Digital Channels	LT	3/31/2018
Item 3	end to end flow from calling channels to OMS	Patty Jasper/ DT Thomas / Steve Neglia (Reliability Team)	Review architecture and infrastructure to improve end to end workflow from calling channels to OMS. More information through WM and MQ. Determine if providing an off-line process to handle high volume outage reporting is appropriate.	LT	3/31/2018
Item 4	Systems reporting conflicting data. OMS Status and Mobile Outage reporting tool were not showing the same data.	Patty Jasper/ DT Thomas / Steve Neglia (Reliability Team)	One authoritative source of data.	LT	3/31/2018

Item 5	COE dependent on OMS. COE enter and wait on OMS for feedback. Causes delay.	Patty Jasper/ DT Thomas / Steve Neglia (Reliability Team)	Investigate can the COE link to OMS be rearchitected.	LT	3/31/2018
Item 6	COE slowness and availabality caused multiple outage tickets to be emailed to DCC	Patty Jasper/ DT Thomas / Steve Neglia (Reliability Team)	Review COE architecture to see if more CPU/hardware is needed to support higher volume than expected users (600 expected versus 1600 actual)	LT	3/31/2018
	Other Improvements				
	Identified Gap	**Owner**	**Actions**	**ST or LT**	**Completion**
Item 1	IT given conflicting direction from Senior management during the storm	Chris Heck	Clearly defined owner with business partner to escalate issues	ST	12/31/2017
Item 2	OMS server located in Florida Regional HQ	Jane Brown	Review location of critical infrastructure	LT	3/31/2018
Item 3	Storm prep manual	Frank Cook	Investigate ability to automate any portions of storm prep	LT	3/31/2018
Item 4	Reliance on data link to Florida	Frank Cook	Investigate the consequences and develop plan for loss of the data link to Florida during storm. (Lose communications to core OMS at FL. Reg. HQ. Lose Charlotte to FL.	LT	3/31/2018
Item 5	Lack of storm execution practice	Chris Heck	Conduct annual table top exercises for storms	LT	3/31/2018
Item 6	Key decisions that need to be made prior to the storm	Patty Jasper/ DT Thomas / Steve Neglia (Reliability Team)	Codify the prestorm checklist made prior to Irma	ST	12/31/2017
Item 7	outbound communication options	Patty Jasper/ DT Thomas / Steve Neglia (Reliability Team)	Should we send out outage notification when restoration time changes (sooner)	LT	3/31/2018
Item 8	Agile changes and system health	Patty Jasper/ DT Thomas / Steve Neglia (Reliability Team)	How do we ensure systems stay healthy as we implement changes in agile methodology.	LT	3/31/2018
Item 9	Managing expectation for information. Constant request for updates from technical teams distracting to restoring service	Frank Cook	Have request for updates flow through the leader of the IT War room. Determine cadence for updates to business partners and communicate updates on the cadence.	LT	3/31/2018
Item 10	Efficiency in deploying resources across War rooms	Frank Cook	Detemine where to deploy CIO staff across business areas (IT War room, DCC, TCC, IST, call centers, impacted regions)	LT	3/31/2018
Item 11	Lack of communications plan	Frank Cook	Enact an overall daily communication plan of activities - IST, DCC, IT, Corp. Comm., Call Center	LT	3/31/2018
Item 12	Formal process to track and review actions	Chris Heck	Create a formal process to track and review quality of completed actions from lessons learned.	ST	12/31/2017

Glossary – Core Customer Related Systems			
System	**Full Name**	**Vendor**	**Definition**
CBIS	Customer Billing Information System	Internal	DEC West Carolinas Customer Billing System
CMS	Customer Maintenance System	Internal	DEMW Customer Maintenance System
CSS	Customer Service System	Internal	DEF Florida Customer Service System
CIM	Customer Information Management	Internal	DEP Carolinas East Customer Information Management
IVR	Integrated Voice Response	Internal	Integrated Voice Response
OAA	Online Account Access	Internal	DEP & DEF Online Account Access
OLS	Online Services	Internal	DEC & DEMW authenticated online access
IC	Interaction Center	Avaya	Avaya soft phones used by call center specialists
Customer Contact Citrix		Citrix	Citrix interface used by 3rd party vendor for CIS handling
Openway	Openway	Itron	DEE Platform for capturing AMI (Automated Metering Interface) data
MDM	Meter Data Management	Oracle	DEE platform for managing and storing smart meter data produced by AMI
EDMS	Energy Data Management System	Oracle	DEO platform for managing and storing smart meter data produced by AMI
IEE	Itron Enterprise Edition	Itron	DEC meter data collection and management for large customers
MV90	MV90	Itron	DEP/DEF meter data collection and management for large customers
FCS	Field Collection System	Itron	DEE meter data collection system for non-AMI meters (drive-by, walk by)
DOMS Carolina	Distribution Outage Management System	Oracle	DEC Outage Management System. This System includes DOMS Duke Call Entry SE and DOMS Web Workspace Carolinas
DOMS MW	Distribution Outage Management System	Oracle	DEM Outage Management System. This System includes DOMS Duke Call Entry MW and DOMS Web Workspace MW
InService	InService	Intergraph	DEF Outage Management System
TCA CADOPS (NMS)	CADOPS	ABB	DEP Outage Management System. This System includes CADOPS and Common Outage Entry
DMS/SCADA	Distribution Management System	GE	DEC SCADA and Distribution Management System

Carolina			
DMS/SCADA MW	**Distribution Management System**	**GE**	**DEM SCADA and Distribution Management System**
DMS/SCADA DEP	**Distribution Management System**	**Schneider**	**DEP SCADA and Distribution Management System**
DMS/SCADA DEF	**Distribution Management System**	**Schneider**	**DEF SCADA and Distribution Management System**
Service Suite	**Service Suite**	**Ventyx**	**DEE Mobile Work Management System**