

STAFF'S SECOND DATA REQUEST
via email

Homestead Energy Services Response

Municipal Electric Utility of the City of Homestead. FL

Re: Docket No. 20170215-EU - Review of electric utility hurricane preparedness and restoration actions.

Underground Facilities

- For each year, please complete the following tables summarizing the number of miles of transmission and distribution underground facilities by county from 2006 through 2017.

Transmission			
ALL Years			
County	Overhead to Underground	New Construction	Total Miles
Miami-Dade	Zero	Zero	Zero

All Transmission Lines are Overhead due to the excessive cost associated with placing these lines underground.

Distribution lines				
Year	County	Overhead to Underground	New UG Construction	Total New UG Miles
2006	Miami-Dade		3.25	3.25
2007	Miami-Dade		7.35	7.35
2008	Miami-Dade		13.87	13.87
2009	Miami-Dade		2	2
2010	Miami-Dade		0.09	0.09
2011	Miami-Dade		0.21	0.21
2012	Miami-Dade	0.035	0.7	0.7
2013	Miami-Dade		1.29	1.29
2014	Miami-Dade	0.24	1.17	1.41
2015	Miami-Dade		0.75	0.75
2016	Miami-Dade	0.131	2.121	2.252
2017	Miami-Dade	0.22	2.847	3.067

County	Year	Total Miles UG	Total Miles OH
Miami-Dade	2005	56.72	109.66
Miami-Dade	2006	59.97	
Miami-Dade	2007	67.32	
Miami-Dade	2008	81.19	
Miami-Dade	2009	83.19	

Miami-Dade	2010	83.28	
Miami-Dade	2011	83.49	
Miami-Dade	2012	84.19	
Miami-Dade	2013	85.48	
Miami-Dade	2014	86.65	
Miami-Dade	2015	87.4	
Miami-Dade	2016	89.521	
Miami-Dade	2017	92.368	110.76

Forensic Data

2. For Hurricanes Hermine, Matthew, Irma, Maria, and Nate, please provide a complete copy of the utility’s post-storm forensic review of damaged infrastructure. If a forensic review was not performed or not documented, please explain why.

A. Our electric utility was only impacted by Hurricane Irma. Our Forensic review is included in Appendix A at the end of this report.

Coordination

3. For Hurricanes Hermine, Matthew, Irma, Maria, and Nate, please provide the name, frequency, and description of non-Emergency Operations Centers related coordination efforts with local governments before, during, and after restoration, including the following.

- a. Storm preparation
- b. Critical infrastructure
- c. Tree trimming, planting or relocation of trees
- d. Hardening and underground projects
- e. Shared facilities
- f. Other

A. The Electric Utility for the City of Homestead is a City Department, and a part of the municipal government. As such, the electric utility is integrally connected to the City

in all communications related to both day-to-day operations as well as hurricane and other emergency event preparation. City Management meetings are held weekly at 2pm on Monday to discuss all city departmental issues and the status of ongoing and upcoming projects. During and following a storm event, the electric utility department is represented at the City’s EOC and provides all attendees with status updates on restoration progress.

- a. The Electric Utility has a section in the “City of Homestead Hurricane Plan” and in the city’s “Continuity of Operation Plan” for any disaster event. The Electric Utility department participates in the City’s drills for Hurricane preparation and the department also holds their own drills separate from the larger City meetings.
 - i. City Drill dates -2/7/17 & 5/2/17
 - ii. Electric Utility Drill dates 8/27/17 & 8/28/17
- b. Feedback and input from other city departments is solicited yearly related to identifying Critical Infrastructure Facilities, Elderly Care Facilities, Lists for customers on Medically Essential Equipment and identification of any other community priorities. Restoration updates are discussed during and after storm events at the City’s EOC meetings, and adjustments made to priorities if necessary.
- c. Tree trimming – the City has ordinances in place which prohibit tall trees from being planted under power lines (Section 29-12.e), allow access to easements for tree trimming (Section 25-110), require property owners to keep trees trimmed a minimum of 6 feet away from overhead power lines (Section 17-28), and hold property owners responsible for damages caused by tree roots on their properties (Section 24-65.a). Any tree trimming issues that arise are addressed by the electric utility with the assistance of code enforcement, if needed. Daily tree trimming is done on a continuous three year circuit cycle (all circuits are trimmed within a three year time frame) with the award for the Tree Trimming Bid approved by Council.
- d. Storm Hardening is a yearly Capital Improvement Project approved by the City Council at the budget hearings. Undergrounding of the electrical services for new subdivisions is mandated by Miami-Dade County Code, and any undergrounding of existing main electrical lines (going from overhead to underground) is also listed as Capital Improvement Project and requires City Council approval in order to proceed.
- e. As a City Department, the assets of the Electric Utility are City assets, and the City Council has the ultimate responsibility for approving any major upgrades, additions and changes.

4. Please complete the following tables on county and state Emergency Operations Centers staffing for Hurricanes Hermine, Matthew, Irma, Maria, and Nate.

Staffing for County Emergency Operations Centers		
Number of Utility Personnel	Function	Total Man-Hours
2 City employees (not Utility department employees)	Matthew – Liaison for all City functions Irma – Liaison for all City functions	Matthew - 24 Hours Irma - 200 Hours

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Staffing for State Emergency Operations Center		
Number of Utility Personnel	Function	Total Man-Hours
None		

Solar

5. Please provide the following information for utility interconnections with customer-owned solar generation that did not operate as designed and consistent with the tariff during the extreme weather events that occurred in 2015 through 2017.

- a. The number of failures.
- b. A description of the cause or causes of such failures.
- c. Possible failure remediation and associated cost.
- d. Discuss whether the failures contributed to an increase or decrease in the utility’s service restoration time and, if possible, provide an estimate of the duration impact.
- e. Discuss whether the failures contributed to an increase or decrease in the utility’s service restoration costs and, if possible, provide an estimate of the restoration cost impact.

A. The City of Homestead was only impacted by Hurricane Irma. At the time Hurricane Irma hit, there were 16 net metering accounts for utility interconnections with customer-owned solar generation in the Homestead Energy Services electrical territory. None of these interconnections reported any failures of their systems to the City. No employee or Mutual Aid time was spent working on any solar generator interconnection problems following Hurricane Irma. The systems are owned and maintained by the customers and provide power to their homes and businesses.

6. Please provide the following information for utility interconnections with customer-owned solar generation that operated as designed and consistent with the tariff during the extreme weather events that occurred in 2015 through 2017.

a. Discuss whether these interconnections contributed to an increase or decrease in the utility's service restoration time and, if possible, provide an estimate of the duration impact.

A. There was no impact to the utility's restoration time.

b. Discuss whether these interconnections increased or decreased the utility's service restoration costs and, if possible, provide an estimate of the restoration cost impact.

A. There was no impact to the utility's restoration cost.

7. Without compromising safety, are there changes to the utility's interconnection with customer-owned solar generation that would enable the customer's facilities to be energized by its solar generation should the utility be unable to provide electric service due to a future storm damaging utility infrastructure?

A. There are no changes planned by our utility. We follow the IEE (Institute of Electrical and Electronics Engineers) standard 1547 so that our employees are not exposed to the dangers of electrical back-feed on a de-energized electrical circuit.

a. If yes, please provide the following information:

- Please describe the suggested changes to the utility's interconnection.
- If the utility is not pursuing the interconnection changes please explain why.

A. The changes would need to be made to the IEEE Standard. We do not have the authority or the influence on IEEE standards committees to make that change. IEEE is the world's largest technical professional organization dedicated to advancing technology for the benefit of humanity and develops standards used by the power and energy industries.

8. Without compromising safety, please describe potential changes to a customer's facilities that the customer can implement to enable the customer's facilities to be energized by its solar generation should the utility be unable to provide electric service due to a future

storm event that damages utility infrastructure. Include in your response whether the utility makes it a practice to inform the customer of such options.

A. We do not have the in-house expertise to supersede the IEEE standard. The IEEE fosters the development of standards that often become national and international standards in the energy and power industries.

9. Without compromising safety, please describe any potential changes to rules or tariffs pertaining to utility interconnections with customer-owned solar generation that would enable the customer's facilities to be energized by its solar generation should the utility be unable to provide electric service due to a future storm event that damages utility infrastructure.

A. If a separate method for providing power to the inverter can be identified, tested and proven safe, then rules and tariffs could be crafted that allow the customer to use that secondary source. There would need to be a fool proof disconnection from the electrical grid to ensure the safety of powerline workers and the public.

10. Please provide the following information for utility interconnections with utility-scale solar generation that did not operate as designed during the extreme weather events that occurred in 2015 through 2017.
- a. The number of failures.
 - b. A description of the cause or causes of such failures.
 - c. Possible failure remediation and associated cost.
 - d. Discuss whether the failures contributed to an increase or decrease in the utility's service restoration time and, if possible, provide an estimate of the duration impact.
 - e. Discuss whether the failures contributed to an increase or decrease in the utility's service restoration costs and, if possible, provide an estimate of the restoration cost impact.

A. The City of Homestead's Electric Utility department does not yet have any utility scale solar generation. Participation is planned in a project scheduled to go on line in 2020.

11. Please provide the following information for utility interconnections with utility-scale solar generation that operated as designed during the extreme weather events that occurred in 2015 through 2017.

- a. Discuss whether these interconnections contributed to an increase or decrease in the utility's service restoration time and, if possible, provide an estimate of the duration impact.
- b. Discuss whether these interconnections increased or decreased the utility's service restoration costs and, if possible, provide an estimate of the restoration cost impact.

A. The City of Homestead's Electric Utility department does not yet have any utility scale solar generation. Participation is planned in a project scheduled to go on line in 2020.

Please file all responses electronically no later than January 18, 2018 from the Commission's website at www.floridapsc.com, by selecting the **Clerk's Office** tab and **Electronic Filing Web Form**. Please contact me at wtaylor@psc.state.fl.us or at 850.413.6175 if you have any legal questions, or contact Emily Knoblauch for technical questions at eknoblau@psc.state.fl.us or at 850.413.6632.

APPENDIX A

FORENSIC DATA

Hurricane Irma

Homestead Energy Services

City of Homestead, FL

September 2017

Failure Causes for Outage Samples

Situation	Cause	Percentage
Pole Down/Broken	Wind Loading due to multiple attachments	30%
	Poor Condition	34%
	High Winds - possible micro bursts	17%
	Trees	9%
	Guying	6%
	Unknown	3%
SAMPLE SIZE = 99		

Wire Down	High Winds - possible microbursts	3%
	Trees	67%
	Guying	8%
	Wire Splice failure	23%
SAMPLE SIZE = 39		

Situation	Address	# of poles	Recent Inspection?	Hardened?	Failure Code	Failure Codes
Pole Down/Broken	SW 187 Ave & 2 St - 10 poles	10 N		N	A	A Wind Loading due to multiple atta
	SW 6 Ave & 6 St - 12 poles	12 N		N	C	B Poor Condition
	SW 187 Ave BTW 336 & 320 St	10 N		N	A	C High Winds - possible microbursts
	W. Mowry - SW 4 St/SW 14 Ave	4 N		N	C	D Trees
	S of NE 8 St/ W of NE 43 Ave	1 N		N	B	E Guying
	NE 8 St/W of NE 12 Ave	1 N		N	D	F Unknown
	308 St & 165 Ave	1 N		N	E	
	30 NW 15 St	1 N		N	A	
	45 NW 20 St	1 N		N	A	
	711 SW 8 St	1 N		N	F	
	440 SW 6 Ter	1 N		N	B	
	SW 5 St & SW 6 Ter	1 N		N	E	
	1391 NW 8 St NW Corner	1 N		N	D	
	NE C/O SW 3 Ave & SW 1 St	1 N		N	A	
	716 SW 10 Ave	1 Y		N	B	
	500-516 SW 9 Ave	2 Y		N	B	
	1150 W Mowry (East Side)	1 Y		N	B	
	1225 NW 2 St	1 Y		N	B	
	31200 SW 187 Ave	1 Y		N	B	
	28802 SW 172 Ave	1 Y		N	B	
	1009 NW 6 St	1 Y		N	B	
	827 NW 4 St	1 Y		N	B	
	630 Roberts Rd R/O	1 Y		N	B	
	625 NW 9 Ave	1 Y		N	B	
	1787 NW 9 Ave	1 Y		N	B	
	206-232 NE 1st RD	4 Y		N	B	
	255 NE 3rd Dr	1 Y		N	B	
	725 SW 1 Ave	1 Y		N	B	
	SW 6 Ave & SW 8 St	1 Y		N	B	
	401 SW 6 Ave	1 Y		N	B	
	130 SW 4 Ave	2 Y		N	B	
	61 NW 7 St	1 Y		N	B	
	38 NW 8 St	1 Y		N	B	
	194 NW 7 St	1 Y		N	B	
	706 Roberts Rd	1 Y		N	B	
	29441 SW 157 Ct	1 Y		N	B	
	436 SW 8 Ave	1 Y		N	B	
	50 NW 22 St	1 N		N	A	
	529 SW 192 Ave	1 N		N	E	
	SW 187 Ave s/o NW 14 St	1 N		N	C	
	SW 181 Ave & SW 292 St	1 N		N	D	
	1513 NW 6 Ave	1 N		N	B	
	1017 NE 2 St	2 N		N	A	
	241 W Flagler	1 N		N	A	
	1500 E Mowry	1 N		N	A	
	15725 SW 297 St	1 N		N	D	
	NW 6 Ave & 3 St	1 N		N	E	
	400 NE 18 Ave	1 N		N	E	
	238 NW 6 Ave	1 N		N	A	
	SW 288 St & 170 Ave	1 N		N	D	
	1580 NE 11 St	1 N		N	B	
	NW 1 Ave & 15 St	1 N		N	B	
	610 NW 16 St	1 N		N	E	
	28802 SW 172 Ave	1 N		N	D	
	Flagler R/O Sedanos	1 N		N	A	
	SW 162 Ave & 305 St	1 N		N	B	
	SW 162 Ave & 293 St	1 N		N	D	
	SW 162 Ave & 299 St	1 N		N	D	
	SW 167 Ave & 312 St	1 N		N	F	
	519 SW 192 Ave	1 N		N	F	
	SW 157 Ave & 297 Ter	1 N		N	D	

Situation	Address	Failure Code	Failure Codes
Wire Down	Krome - SW 8 St to NW 8 St	D	
	SW 187 Ave & 320 St - 3 p/s of 320	D	
	854 NW 9 Ct (Alley)	E	C High Winds - possible microbursts
	SW 6 St & 8 Ave	C	D Trees
	S. Flagler Ave & SW 7 St	G	E Guying
	SW 284 St & 185 Ave	D	F Unknown
	W. Mowry /SW 14 Ave - in the rear	D	G Wire Splice failure
	NW 2 St BTWN NW 6 & 7 Ave	D	
	W of Krome & SE 8 St	D	
	NE 16 Ave & 307 St	D	
	NE 16 Ave & 309 St	D	
	28 NW 20 St	G	
	365 NW 17 Ct	D	
	15317 SW 282 St	D	
	311 NW 8 St	D	
	29950 SW 172 St	G	
	1509 NW 2 Ave	D	
	1860 NE 8 St	G	
	211 NW 8 St	G	
	945 NE 14 St	D	
	948 NE 18 St	D	
	1225 NW 2 St	G	
	30111 SW 169 Ave	D	
	16940 SW 300 St	D	
	28260 SW 158 Ave	D	
	Krome & NE 10 St	G	
	Railroad Ave & SW 6 St	E	
	238 NW 6 Ave	D	
	947 NW 14 Ave	D	
	1278 NW 9 St	E	
	18830 SW 311 St	D	
	19970 SW 311 St	D	
	17821 SW 309 St	D	
	1340 NW 9 Ct	D	
	1490 NW 9 Ct	D	
	116 SE 1 Dr	G	
28765 S Dixie Hwy	G		
1520 NE 11 St	D		
18943 SW 319 St	D		

1. Cascading pole failures where the triggering event was not tree related:
 - Long spans of service drops for heavy service conductors that were not guyed (typically 3-phase, but also for very long single phase)
 - Poles exceeding design strength due to large or multiple telecommunication attachments
 - Un-guyed or improperly guyed corner poles leaned over excessively causing phases to short circuit
2. Poles failures on deteriorated poles. Some did not have an observable OSMOSE inspection tag. Others were marked for failing inspection but had yet to be replaced. Consider bracing restorable poles if pole replacement workload is excessive.
3. One feeder we looked at was allowed to go through excessive number of trip-open-reclose sequences during storm. Allowing such a high number of cumulative faults may result in premature failure of substation transformers and breakers and may also add to post-storm restoration work due to failed pole mounted oil-filled equipment or phase/neutral wire down.
4. Dense tree population caused serious problems in areas south of Redlands sub. In many cases oversized Bayan trees were growing in small residential lots. Should seize the opportunity to launch a bi-lingual outreach campaign to educate customers on proper tree selection and placement near power lines before residents replace trees lost during Hurricane Irma. APPA resources have been developed to assist with a "right tree in the right place" campaign.

Independent assessment

from FM PA PE
Cairo Vanegas

Friday, September 15, 2017

Barbara Quinones

From: Carl Turner <Carl.Turner@fmpa.com>
Sent: Friday, September 15, 2017 11:11 AM
To: Barbara Quinones
Cc: Cairo Vanegas; Frank Gaffney
Subject: Visit Observations

Barbara,

We spoke with Manny about most of this – feel free to pass along. We are glad to answer questions. Cairo will send observations on the distribution infrastructure (or will call to discuss it).

Distribution Coordination

- ? We heard some stories from staff about issues that may exist but for which we haven't found any specific evidence. Manny indicated cold load pickup is considered when reviewing coordination and main feeder relay settings but it sounds like it may be an issue for some feeders.
- ? Homestead has CYME and Windmil but not using much – staff need to learn, and it sounds like the Windmil database is not fully commissioned and has issues that need to be resolved which occurred during the initial translation from GIS. It sounds like the intent was for Windmil to be used going forward. We know some consultants that specialize in getting people started and training them on Windmil. It is incredibly useful and would help Homestead investigate many of the coordination issues below, as would CYME.
- ? Intellirupter switches were implemented but with a quick, simple consideration of coordination. No time / not enough assistance to get a full review to get the ideal configuration of the feeder coordination scheme. Manny recognizes this and has ideas about how to improve – need consulting help. We can help there. Basically the main feeder settings and general consideration of the way the scheme is constructed may be able to be adjusted to better utilize the AFS.
- ? Issues that we note will take time to resolve and decide on a path forward
 - o Although the standard fuses (65, 40 KS) generally coordinate, the feeder fault levels appear to be occurring mostly in regions of simultaneous melting and in some cases the fuse-saving scheme may not be able to perform its function. Also as a side note- my quick check in my regional SC database indicates that some of the fault levels Manny and team were given when the AFS was installed may be a little on the low side (even with all Homestead generators offline). I suggest that be confirmed. We can help get you new source impedances (or FPL can), and then once the Windmil model is functional, they can check the fault levels using it.
 - o Need a fuse selection chart in addition to a transformer fuse tables – allows selection of fuses based on conductor size and based on location in the system – dramatically improves coordination, and the ability to maintain it over time – I'm looking for an example graphic I can send. It is not a table; it's a combination of a feeder graphic and a table that allows you to select fuses based on whether laterals or upline or downline of your intellirupters.
 - o Fault currents close to the substation are not currently coordinated – need to asses as part of a true coordination study. Could be larger fuses, additional delays on instantaneous elements, current limiting fuses etc.
- ? Lack of visibility and flexibility on the main feeder relays – Manny indicates he has proposed to change out the feeder relays – based on our efforts to investigate events, the existing relays are well behind the times in terms of what you can discern. For example – there was an issue experienced while attempting to energize a transformer (the main feeder relay tripped), and even with the data captured by the ABB REF551 feeder relay, no one could discern what happened during the event. The 551 may have oscillography but this feature is not set up. The proposed SEL replacements would be much easier for staff to manage, get support on, and would provide much better information about events measured on feeders.

- ? Feeder relays need feeder impedances so they can provide projections of fault location – this could be an issue for only the 1390 feeder, or it could be all feeder relays. The 1390 REF551 has a generic, small impedance entered so it is not able to provide you with an estimate of fault location – this is also something the new SEL relays are very good at, but at minimum entering these values in the existing ABB relays will help you.
- ? Also if there is a way to get waveform capture set-up and operating, that would be another good interim step (it still will be better with new feeder relays).

If you or Manny would like any help talking to the consulting firms about scopes of work or with selecting a firm for a specific task, please do not hesitate to call.

Regards
Carl

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