



**CITY OF
MOUNT
DORA**

PUBLIC WORKS AND UTILITIES

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Mount Dora, FL 32757

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Fax: 352-735-4801

Finance Department
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Human Resources
352-735-7106
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Planning and Development
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City Hall Annex
900 N. Donnelly St.
Mount Dora, FL 32757

Parks and Recreation
352-735-7183
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Public Safety Complex
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Mount Dora, FL 32757

Police Department
352-735-7130
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Fire Department
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Public Works Complex
1250 N. Highland St.
Mount Dora, FL 32757
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W. T. Bland Public Library
1995 N. Donnelly St.
Mount Dora, FL 32757
352-735-7180
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Website:
www.cityofmountdora.com

VIA EMAIL (pbuys@psc.state.fl.us)

February 21, 2020

Penelope Buys
Florida Public Service Commission
2540 Shumard Oak Boulevard
Tallahassee, FL 32399-0850
Email: pbuys@psc.state.fl.us

RE: City of Mount Dora Storm Hardening Report for Rule 25-6.0343 F.A.C

Dear Ms. Buys:

Attached to this letter is the City of Mount Dora Storm Hardening Report pursuant to Rule 25-6.0343 F.A.C. for Calendar Year 2019. The City is submitting this report to you via email and will not be sending a hard copy to the FPSC via U.S. mail unless you request it.

Please verify receipt of this report by an email response to me at my email address shown below.

If you have any questions, feel free to contact me.

Very truly yours,

Steve Langley
Electric Utility Director

Phone: (352) 735-7155, x1815
Email: langleys@cityofmountdora.com

City of Mount Dora
Storm Hardening Report to the Florida Public Service
Commission Pursuant to Rule 25-6.0343, F.A.C.
Calendar Year 2019

1) Introduction

a) Name of city/utility

City of Mount Dora

b) Address, street, city, zip

900 North Donnelly Street
Mount Dora, FL 32757

c) Contact information: Name, title, phone, fax, email

Mr. Steve Langley
Electric Utility Director
Phone: (352) 735-7155, ex 1815
Fax: (352) 735-1539
Email: langleys@cityofmountdora.com

2) Number of customers served in calendar year 2019

Approximately 5,853 Customers

3) Standards of Construction

a) *National Electric Safety Code Compliance*

The City of Mount Dora (City) retained an engineering firm which made a field review of the City's electric distribution system to determine the extent that its construction standards, policies, guidelines, practices, and procedures comply with the various editions of the National Electrical Safety Code (NESC) that were in effect during the construction of the City's distribution system.

The engineering analysis investigated the maximum allowable span distances between poles and the ultimate loading on guy wires, anchors, and poles. The report made recommendations for major planned work and targeted critical infrastructure covering the following construction standards:

1. Specification of anchors and guy wire strength
2. Guying standards to attach guy wires to all level of construction on poles including secondary and communication cable pole attachments
3. Specification of wood and concrete poles for various span distances

The City is using the engineering study to evaluate its existing distribution system to identify facilities where the new construction standards should be implemented.

The engineering firm also developed construction standards drawings for its 12 kV distribution poles. The standards focused primarily on three-phase poles, since these form the backbone of the City's distribution system. The construction standards drawings will be very valuable during storm events when other utilities are called to assist the City in rebuilding its main distribution feeders.

The City has replaced many older overhead distribution facilities during the last ten years using new concrete poles, new insulators, and other new equipment. The City believes that its existing distribution system can withstand damage caused by extreme weather, based upon its experiences during the hurricanes of 2004 and Tropical Storm Fay in 2008. Hurricane Irma caused some damage to the distribution system, but the City was able to complete the major repairs in approximately six days.

For new construction, the City uses concrete poles almost exclusively for its main distribution feeders. All new construction conforms to the new construction standards identified by the engineering firm.

The City's five year Capital Improvement Program includes a Wood Pole Replacement Program that hardens the distribution system by replacing older wood poles for the City's main distribution feeders with concrete or fiberglass poles. The City has also made annual field inspections of its overhead distribution facilities since 2008.

Subject to future budget constraints, the City intends to make further engineering evaluations of its electric distribution system to insure compliance with the NESC.

b) Extreme Wind Loading Standards

Per Figure 250-2(d) of the 2012 edition of the NESC, the extreme wind loading standard for the City is approximately 102 MPH, using linear interpolation between wind contours as permitted by the NESC. The City's central Florida location is very close to the 100 MPH wind contour line.

The City retained an engineering firm to insure that its construction standards, policies, guidelines, practices, and procedures meet the Extreme Wind Loading Standard for 1) new construction; 2) major planned work, including expansion, rebuild, or relocation of existing facilities, assigned on or after December 10, 2006; and 3) targeted critical infrastructure facilities and major thoroughfares. The City is using the engineering study to evaluate its existing distribution system to identify facilities where the new construction standards should be implemented to comply with the Extreme Wind Loading Standards.

The construction standards drawings for distribution poles that the City has developed reflect the extreme wind loading standard. All new construction conforms to the new construction standards identified by the engineering firm.

The City requires that all new or upgraded customer electrical services be installed underground. In addition, the City installs underground distribution systems for all new subdivisions or similar large projects. These underground systems are less subject to damages from extreme winds.

The City's five year Capital Improvement Program includes a Wood Pole Replacement Program that hardens the distribution system by replacing older wood poles with concrete or fiberglass poles for the City's main distribution feeders. The new concrete poles are inherently stronger and capable of higher wind loading.

The City is also participating in the Public Utility Research Center's (PURC) *Attachment 1*, granular wind research study through the Florida Municipal Electric Association. The City will continue to self-audit and evaluate its distribution system to determine any immediate needs for system upgrades and hardening in specific areas. In addition, the City will monitor the results of this research to determine the most appropriate response for system upgrades and hardening.

Subject to future budget constraints, the City intends to make further engineering evaluations of its electric distribution system to insure compliance with the Extreme Wind Loading Standards of the NESC.

c) *Flooding and Storm Surges*

Electrical construction standards, policies, guidelines, practices, and procedures at the City address the effects of flooding on underground distribution facilities and supporting overhead facilities. Because of the hilly terrain around Mount Dora, flooding of low-lying areas is not generally a problem.

The City is not subject to storm surges because of its inland location.

Through the Florida Municipal Electric Association, the City is participating in the Public Utility Research Center's (PURC) study on the conversion of overhead electric facilities to underground and the effectiveness of undergrounding facilities in preventing storm damage and outages. The City will continue to evaluate and address the effects of flooding but will wait for the results of this research to justify the effort and cost of converting overhead distribution facilities to underground.

d) *Safe and Efficient Access of New and Replacement Distribution Facilities*

Electrical construction standards, policies, guidelines, practices, and procedures at the City provide for placement of new and replacement distribution facilities so as to facilitate safe and efficient access for installation and maintenance. Wherever new facilities are placed, all facilities are installed so that City crews have adequate access to perform maintenance/repairs expeditiously and safely. Most distribution facilities are on public streets which are easily accessible. The City no longer allows back-lot line utility services for new developments. The City requires that all new distribution facilities be near a street or within a utility easement.

e) *Attachments by Others*

As mentioned earlier, the City retained an engineering firm to make an initial analysis of safety, pole reliability, pole loading capacity, or engineering standards for attachments by others to the City's distribution poles. A new construction standard was developed to use guy wires for all levels on poles, including communication cable pole attachments.

The construction standards drawings for distribution poles that the City developed reflect the impact of pole attachments on pole loading capacity.

In addition, knowledgeable field personnel conduct an annual inspection of all of the City's electric facilities to identify obviously overloaded poles. The City has not experienced any failures of poles due to overloading by pole attachments of other entities.

Finally, the City is continuing discussions to update its Pole Attachment and Joint Use agreements with the local telephone, cable, and fiber companies. The new agreements will specifically address pole attachment loadings, adding new attachments, removing attachments, and implementing a formal work order and notification process.

4) Facility Inspections

a) *Describe the utility's policies, guidelines, practices, and procedures for inspecting transmission and distribution lines, poles, and structures including, but not limited to, pole inspection cycles and pole selection process.*

The City electric system consists of distribution lines, poles, and structures – it owns no transmission facilities. Since its service territory is relatively small, the Electric Department has been able to make visual inspections of its six distribution feeders on an annual basis. Wood poles are visually inspected for cracks and a sounding technique is used to determine potential wood rot. On December 5, 2017, the City engaged a contractor to inspect and treat all wood poles in the electric service territory. This project was completed in 2018 and the City used the inspection results to establish a replacement priority.

The City also makes comprehensive field inspections of its distribution lines, poles, and structures. The program consists of an annual field inspection of all six of the City's six distribution feeders, documented with a field report that identifies the following situations:

1. Pole Maintenance Items
2. Vegetation Maintenance
3. Transformer Maintenance
4. CATV Joint Use Attachment
5. Communications Joint Use Attachment

Once the field inspection reports have been completed, City staff goes back to each pole and makes the identified repairs. The City typically schedules the annual field inspections during early summer so that the majority of repairs can be completed before the beginning of hurricane season. If a third-party pole attachment appears damaged or does not meet NESC clearance requirements, the City notifies the respective party in writing.

To supplement the annual field inspections, the City makes additional inspections before the arrival of adverse weather events, such as hurricanes and tropical storms. The pre-storm inspections utilize the same inspection form as the annual field inspection.

Some of the City's distribution lines are attached to 69 kV transmission poles owned by Duke Energy. Any observed problems with the transmission poles are reported directly to Duke Energy.

The City utilizes a GIS mapping system for its electric distribution system. The GIS system is now being used to map and manage all of the City's distribution facilities including wood and concrete poles, attached hardware, pole attachments by other entities, and underground electrical facilities.

b) Describe the number and percentage of transmission and distribution inspections planned and completed for 2019.

The City completed its annual field inspections of its distribution system during the summer of 2019, making inspections of all six feeder circuits. The City completed 100% of its planned inspections.

The City owns no transmission facilities so no inspections were made.

c) Describe the number and percentage of transmission poles and structures and distribution poles failing inspection in 2019 and the reason for the failure.

The City completed its comprehensive field inspections of all six distribution feeders during the summer of 2019.

The table below summarizes the numbers, percentages, and reasons that distribution poles failed the 2019 field inspections:

Circuit	Pole Maintenance Items	Vegetation Maintenance	Transformer Maintenance	CATV Joint Use Attachment	Communications Joint Use Attachment	Circuit Totals
M593	32	4	3	13	11	63
Percent of Total	50.8%	6.3%	4.8%	20.6%	17.5%	100.0%
M594	10	3	4	3	13	33
Percent of Total	30.3%	9.1%	12.1%	9.1%	39.4%	100.0%
M595	16	31	8	10	1	66
Percent of Total	24.2%	47.0%	12.1%	15.2%	1.5%	100.0%
M596	15	26	0	0	8	49
Percent of Total	30.6%	53.1%	0.0%	0.0%	16.3%	100.0%
M597	37	28	1	42	17	125
Percent of Total	29.6%	22.4%	0.8%	33.6%	13.6%	100.0%
M598	6	20	9	3	38	76
Percent of Total	7.9%	26.3%	11.8%	3.9%	50.0%	100.0%
All Circuits	116	112	25	71	88	412
Percent of Total	28.2%	27.2%	6.1%	17.2%	21.4%	100.0%

The City owns no transmission facilities.

d) Describe the number and percentage of transmission poles and structures and distribution poles, by pole type and class of structure, replaced or for which remediation was taken after inspection in 2019, including a description of the remediation taken.

The City remediated all of the issues identified in the annual field inspection shown above and has replaced or is replacing the identified rotten or damaged wood poles. Based on the inspections conducted in 2018 and 2019 for the Wood Pole Replacement program, the City replaced thirty-five (35) wood poles, twenty-seven (27) of these replacements were upgraded to concrete.

The City attaches its distribution circuits to certain Duke Energy 69 kV transmission poles that are within the City's electric service area. Of the 90 transmission poles, 34 are wood. Duke Energy has an on-going program of replacing its older wood poles with steel poles. While these transmission poles are not owned by the City, the pole replacement program improves the ability of the City's distribution system to better withstand storm events since its distribution circuits attach to the poles. Moreover, hardening the two Duke Energy 69 kV transmission circuits that feed the Mount Dora Substation improves overall reliability.

The following table lists all wood poles that were replaced with concrete, fiberglass, or steel poles in 2019:

Description	Number of Poles at 1/1/19				Wood Pole Replacements	Added Poles	Removed Poles	Number of Poles at 12/31/19	
	Original Count	Inventory Adjustment ⁽¹⁾	Revised Count	% of Total Poles	Count	Count	Count	Count	% of Total Poles
Wood Poles									
25 foot	143	0	143	4.9%	(14)		(2)	127	4.4%
30 foot	637	0	637	22.0%	(14)	8		631	21.9%
35 foot	38	0	38	1.3%	(2)			36	1.2%
40 foot	437	0	437	15.1%	(5)			432	15.0%
45 foot	453	0	453	15.7%				453	15.7%
50/55 foot	0	0	0	0.0%				0	0.0%
Duke Energy Transmission ⁽²⁾	34	0	34	1.2%	(35)			34	1.2%
Total Wood Poles	1,742	0	1,742	60.3%	(35)	8	(2)	1,713	59.3%
Concrete/Fiberglass/Steel Poles									
30 foot	469	0	469	40.9%	21			490	41.7%
35 foot	0	0	0	0.0%				0	0.0%
40 foot	229	0	229	20.0%	5			234	19.9%
45 foot	387	0	387	33.7%	1			388	33.0%
50/55 foot	6	0	6	0.5%				6	0.5%
Duke Energy Transmission ⁽²⁾	56	0	56	4.9%				56	4.8%
Total Concrete/Fiber/Steel	1,147	0	1,147	39.7%	27	0	0	1,174	40.7%
Total Poles:	2,889	0	2,889	100.0%	(8)	8	(2)	2,887	100.0%

(1) The number of poles in the table were adjusted to reflect field inventory updates for the GIS mapping system.

(2) Duke Energy Transmission Poles within the City's electric service area.

The City owns no transmission facilities.

5) Vegetation Management

- a) *Describe the utility's policies, guidelines, practices, and procedures for vegetation management, including programs addressing appropriate planting, landscaping, and problem tree removal practices for vegetation management outside of road right-of-ways or easements, and an explanation as to why the utility believes its vegetation management practices are sufficient.*

The City's Electric Division trims trees on a 12 month cycle using an outside contractor with a two-man crew working 40 hours per week. This contractor focuses on clearing vegetation that could adversely impact the reliability of the City's electric distribution system and to insure compliance with the NESC. In addition to the contractor crew, the City employs one two-man crew that is continuously trimming trees and reducing vegetative growth throughout other parts of the City. In some situations, the City crew assists the contractor crew in trimming or removing large trees.

The City routinely removes limbs from trees located outside road right-of-ways or easements that could create clearance problems for its overhead distribution circuits. The City has also removed entire trees in such locations if those trees threaten overhead distribution circuits (usually dead trees in danger of falling).

The City believes that its vegetation management practices result in high reliability because it trims trees on a 12 month cycle, which is much more frequent than the practices of other Florida electric utilities.

- b) *Describe the quantity, level, and scope of vegetation management planned and completed for transmission and distribution facilities in 2019.*

The City Electric Division trimmed trees on a 12 month cycle using an outside contractor with a two-man crew working 40 hours per week. The City also removed limbs from trees located outside road right-of-ways or easements that could create clearance problems for its overhead distribution circuits.

The City owns no transmission facilities.

6. Storm Hardening Research

The City is a member of the Florida Municipal Electric Association (FMEA), which is participating with all of Florida's electric utilities in storm hardening research through the Public Utility Research Center at the University of Florida, (*Attachment 1*). Under separate cover, FMEA is providing the FPSC with a report of research activities. For further information, contact Amy Zubaly, Executive Director, FMEA, 850-224-3314, ext. 1, or azubaly@publicpower.com.

ATTACHMENT # 1

Report on Collaborative Research for Hurricane Hardening

Provided by

The Public Utility Research Center
University of Florida

To the

Utility Sponsor Steering Committee

Final Report dated February 2020

I. Introduction

The Florida Public Service Commission (FPSC) issued Order No. PSC-06-00351-PAA-EI on April 25, 2006 (Order 06-0351) directing each investor-owned electric utility (IOU) to establish a plan that increases collaborative research to further the development of storm resilient electric utility infrastructure and technologies that reduce storm restoration costs and outages to customers. This order directed IOUs to solicit participation from municipal electric utilities and rural electric cooperatives in addition to available educational and research organizations. As a means of accomplishing this task, the IOUs joined with the municipal electric utilities and rural electric cooperatives in the state (collectively referred to as the Research Collaboration Partners) to form a Steering Committee of representatives from each utility and entered into a Memorandum of Understanding (MOU) with the University of Florida's Public Utility Research Center (PURC). In 2018 the Research Collaboration MOU was renewed for an initial term of two years, effective January 1, 2019, and will be automatically extended for successive two-year terms.

PURC performs the administration function for research collaboration, including financial management, logistics, production and distribution of documents, and preparation of reports. PURC also coordinates and performs research as agreed upon with the Steering Committee by facilitating the exchange of information from the Research Collaboration Partners with individuals conducting research projects and facilitating the progress of each research project. The collaborative research has focused on undergrounding, vegetation management, hurricane-wind speeds at granular levels, and improved materials for distribution facilities.

This report provides an update on the activities of the Steering Committee since the previous report dated February 2019.

II. Undergrounding

The collaborative research on undergrounding has been focused on understanding the existing research on the economics and effects of hardening strategies, including undergrounding, so that informed decisions can be made about undergrounding policies and specific undergrounding projects.

The collaborative has refined the computer model developed by Quanta Technologies and there has been a collective effort to learn more about the function and functionality of the computer code. PURC and the Project Sponsors have worked to fill information gaps for model inputs and significant efforts have been invested in the area of forensics data collection.

In addition, PURC has worked with doctoral and master's candidates in the University of Florida Department of Civil and Coastal Engineering to assess some of the inter-relationships between wind speed and other environmental factors on utility equipment damage. PURC has also been contacted by engineering researchers at the University of Wisconsin and North Carolina State University with an interest in the model, though no additional relationships have been established. In addition to universities, PURC has been in contact with stakeholders in Puerto Rico in light of PURC Director Mark Jamison's appointment to the Southern States Energy Board Blue Ribbon Task Force on the future of Puerto Rico's energy system. The stakeholders, government and task force are concerned with strategies to make Puerto Rico's system more resilient and are interested in the role that the model could play. Finally, PURC has been contacted by California stakeholders interested in applying the principles of the model to the mitigation of the interactions between the electricity grid and the surrounding vegetation, potentially reducing the risk of wildfires. Despite the outside interest, there are no concrete plans to expand the scope of the model at this time. Every researcher that contacts PURC cites the model as the only non-proprietary model of its kind.

III. Wind Data Collection

The Project Sponsors entered into a wind monitoring agreement with WeatherFlow, Inc., in 2007. Under the agreement, Florida Sponsors agreed to provide WeatherFlow with access to their properties and to allow WeatherFlow to install, maintain and operate portions of their wind monitoring network facilities on utility-owned properties under certain conditions in exchange for access to wind monitoring data generated by WeatherFlow's wind monitoring network in Florida. WeatherFlow's Florida wind monitoring network includes 50 permanent wind monitoring stations around the coast of Florida, including one or more stations located on utility-owned property. The wind monitoring agreement expired in early 2012; however, it was renewed in April 2017 and will renew automatically annually on the effective date for an additional one year period, unless terminated by the parties to the agreement.

IV. Public Outreach

We have previously discussed the impact of increasingly severe storms and the increased

population and utility infrastructure along the coast on greater interest in storm preparedness. PURC researchers continue to discuss the collaborative effort in Florida with the engineering departments of the state regulators in New York, New Jersey, and Pennsylvania, and regulators in Jamaica, Grenada, Curacao, St. Lucia, the Bahamas, Samoa, and the Philippines. In 2019, stakeholders in Puerto Rico and California also showed interest in the collaborative's efforts. While all of the regulators and policymakers showed great interest in the genesis of the collaborative effort, and the results of that effort, they have not, at this point, shown further interest in participating in the research effort. In 2019, there continued to be considerable interest in Florida's hardening efforts from the popular media in California, in light of continued wildfire problems in the state and their aftermath.

VI. Conclusion

In response to the FPSC's Order 06-0351, IOUs, municipal electric utilities, and rural electric cooperatives joined together and retained PURC to coordinate research on electric infrastructure hardening. The steering committee has taken steps to extend the research collaboration MOU so that the industry will be in a position to focus its research efforts on undergrounding research, granular wind research and vegetation management when significant storm activity affects the state.