CITY OF MOUNT DORA
PUBLIC WORKS AND UTILITIES

City Hall
510 N. Baker St.
Mount Dora, FL 32757

Office of the City Manager
352-735-7126
Fax: 352-735-4801

Finance Department
352-735-7118
Fax: 352-735-1406

Human Resources
352-735-7106
Fax: 352-735-9457

Planning and Development
352-735-7112
Fax: 352-735-7191

City Hall Annex
900 N. Donnelly St.
Mount Dora, FL 32757

Parks and Recreation
352-735-7183
Fax: 352-735-3681

Public Safety Complex
1300 N. Donnelly St.
Mount Dora, FL 32757

Police Department
352-735-7130
Fax: 352-383-4623

Fire Department
352-735-7140
Fax: 352-383-0881

Public Works Complex
1250 N. Highland St.
Mount Dora, FL 32757
352-735-7151
Alt. Tel: 352-735-7105
Fax: 352-735-1539
Alt. Fax: 352-735-2892

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 28, 2017

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 2016. 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,

Charles F. Revell
Electric Utility Manager

Phone: (352) 735-7155, x1802
Email: revellc@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 2016

1) Introduction

a) Name of city/utility

City of Mount Dora

b) Address, street, city, zip

1250 North Highland Street
Mount Dora, FL 32757

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

Mr. Charles F. Revell
Electric Utility Manager
Phone: (352) 735-7155, ex 1802
Fax: (352) 735-1539
Email: revellc@cityofmountdora.com

2) Number of customers served in calendar year 2016

Approximately 5,824 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. These storms caused relatively minor damage to the City's electric distribution system.

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) 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 Division 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. Poles that appear to have wood rot are replaced when they are found, rather than being further inspected below ground level. The City has found that this approach has enhanced the ability of the utility system to withstand storm events.

The City initiated a comprehensive field inspection program for its distribution lines, poles, and structures in 2008. 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. Tree clearance
2. Moss/vines
3. Low-hanging wires or services
4. Loose or missing guy wire
5. Damaged or missing guy guards
6. Rotten or damaged pole
7. Missing or damaged animal guards
8. Broken pins, insulators, or grounds
9. Blown lightning arrestors
10. Damaged switch or jumpers
11. Damaged capacitor bank
12. Damaged pole 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. In 2016, the City made additional storm inspections before Hurricane Matthew.

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 completed implementation of a GIS mapping system for its electric distribution system in 2012. 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 2016.

The City completed its annual field inspections of its distribution system during the summer of 2016, making inspections of all six feeder circuits. The City also made additional inspections before the anticipated arrival of Hurricane Matthew. 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 2016 and the reason for the failure.

The City completed its comprehensive field inspections of all six distribution feeders during the summer of 2016.

The table below summarizes the numbers, percentages, and reasons that distribution poles failed the 2016 field inspections:

Circuit	Tree Trimming Needed	Remove Moss/Vine	Low-hanging Wires	Loose/Missing Guy	Damaged/Missing Guy Guard	Rotten/Damaged Pole	Missing/Damaged Squirrel Guard	Broken Pins/Insulators/Grounds	Blown Lightning Arrestor	Damaged Switch/Jumpers	Damaged Capacitor Bank	Damaged Pole Attachment	Circuit Totals
M593	4	2	-	1	-	-	2	-	-	-	-	-	9
Percent of Total	44.4%	22.2%	0.0%	11.1%	0.0%	0.0%	22.2%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
M594	-	-	-	-	-	-	-	-	-	-	-	-	-
Percent of Total	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
M595	3	-	1	-	2	-	-	-	-	-	-	-	6
Percent of Total	50.0%	0.0%	16.7%	0.0%	33.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
M596	2	8	1	-	5	-	1	1	-	-	-	-	18
Percent of Total	11.1%	44.4%	5.6%	0.0%	27.8%	0.0%	5.6%	5.6%	0.0%	0.0%	0.0%	0.0%	100.0%
M597	1	5	-	-	1	1	-	-	-	-	-	3	11
Percent of Total	9.1%	45.5%	0.0%	0.0%	9.1%	9.1%	0.0%	0.0%	0.0%	0.0%	0.0%	27.3%	100.0%
M598	-	-	-	-	-	1	-	-	-	6	-	4	11
Percent of Total	0.0%	0.0%	0.0%	0.0%	0.0%	9.1%	0.0%	0.0%	0.0%	54.5%	0.0%	36.4%	100.0%
All Circuits	10	15	2	1	8	2	3	1	-	6	-	7	55
Percent of Total	18.2%	27.3%	3.6%	1.8%	14.5%	3.6%	5.5%	1.8%	0.0%	10.9%	0.0%	12.7%	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 2016, 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 2016 for the Wood Pole Replacement program, the City replaced 8 wood poles with concrete poles.

The City attaches its distribution circuits to Duke Energy 69 kV transmission poles that are within the City's electric service area. Of the 90 transmission poles, 39 are wood. Duke Energy continues its 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. Duke Energy completed its initial round of pole replacements in 2015 and has plans for additional replacements.

The following table lists all wood poles that were replaced with concrete, fiberglass, or steel poles in 2016:

	Number of Poles at 1/1/16				Wood Pole Replacements	Added Poles	Removed Poles	Number of Poles at 12/31/16	
Description	Original Count	Inventory Adjustment[1]	Revised Count	% of Total Poles	Count	Count	Count	Count	% of Total Poles
Wood Poles									
25 foot	153	0	153	5.3%				153	5.3%
30 foot	654	0	654	22.7%				654	22.7%
35 foot	38	0	38	1.3%				38	1.3%
40 foot	461	(7)	454	16.0%	(1)			453	15.7%
45 foot	477	(8)	469	16.5%	(7)			462	16.0%
50/55 foot	(15)	15	0	-0.5%				0	0.0%
Duke Energy Transmission[2]	39	0	39	1.4%				39	1.4%
Total Wood Poles	1,807	0	1,807	62.7%	(8)	0	0	1,799	62.3%
Concrete/Fiberglass/Steel Poles									
30 foot	442	0	442	41.0%		2	(1)	443	40.8%
35 foot	0	0	0	0.0%				0	0.0%
40 foot	224	(1)	223	20.8%				223	20.5%
45 foot	359	1	360	33.3%	8	1		369	33.9%
50/55 foot	1	0	1	0.1%				1	0.1%
Duke Energy Transmission[2]	51	0	51	4.7%				51	4.7%
Total Concrete/Fiber/Steel	1,077	0	1,077	37.3%	8	3	(1)	1,087	37.7%
Total Poles:	2,884	0	2,884	100.0%	0	3	(1)	2,886	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 2016.

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.

The Public Utility Research Center has held two vegetation management conferences in 2007 and 2009. Through FMEA, the City has a copy of their reports and will use the information to continually improve vegetation management practices. The City will participate in future best-practices workshops if there is industry interest.

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. Under separate cover, FMEA is providing the FPSC with a report of research activities. For further information, contact Barry Moline, Executive Director, FMEA, 850-224 -3314, ext.1, or bmoline@publicpower.com.