February 26, 2021

Penelope Buys
Engineering Specialist
Division of Engineering
Florida Public Service Commission
pbuys @psc.state.fl.us

Dear Ms. Buys:

Attached is the Gainesville Regional Utilities (GRU) 2020 Storm Hardening Report. We believe all reporting requirements of Rule 25-6.0343 have been addressed and satisfied. However, should there be any unanswered questions, or need for further expansion or clarification, we will address such needs in a timely manner upon notice. GRU has been proactive historically in nearly all facets of the Storm Hardening initiative; we are pleased to report our programs and successes to the Commission.

Sincerely,

Gary Baysinger
Energy Delivery Officer
Cell: (352) 316-6114
BaysingerGL@gru.com

/enclosure

GRU Storm Hardening Report
to the Florida Public Service Commission
Pursuant to Rule 25-6.0343, F.A.C.
Calendar Year 2020

1) Introduction

a) City of Gainesville/Gainesville Regional Utilities (GRU)

b) 4747 N. Main Street
PO Box 147117, Station E2A
Gainesville, Florida 32614-7117

c) Gary Baysinger
Officer, Energy Delivery
Office: (352) 393-1565
Fax: (352) 334-2784
baysingergl@gru.com

2) Number of customers served in calendar year 2020

GRU serves Gainesville proper as well as Gainesville's urban fringe but does not serve the University of Florida main campus. The number of electric customers served in calendar year 2020 was 100,753 which can be broken down by class as follows:

Residential Customers:	87,903
Non-Residential Customers:	12,850
Total:	100,753

3) Standards of Construction

(a) National Electrical Safety Code Compliance

GRU's Material and Construction Standards are continuously maintained and updated to ensure compliance with the applicable version of the National Electric Safety Code (NESC). Construction standards, policies, guidelines, practices and procedures for electric distribution facilities installed prior to December 16, 2012 adhered to the requirements of the version of the NESC in effect at the time of installation. Electric distribution facilities installed subsequent to December 16, 2012 complied with the 2012 version of the NESC. Electric distribution facilities installed subsequent to February 15, 2017 complied with the 2017 version of the NESC.

(b) Extreme Wind Load Standards

GRU's current Material and Construction Standards are guided by the extreme wind loading requirements specified by http://windspeed.atcouncil.org/ as recommended by the 2017 NESC. These standards have been applied to both new construction initiated on or after February 15, 2017 and major planned work that requires the expansion, rebuild or relocation of existing facilities initiated on or after December 16, 2006. Electric distribution facilities installed prior to December 16, 2012 were constructed in compliance with the applicable version of the NESC at that time.

(c) Flooding and Storm Surges

GRU is located in North Central Florida, roughly equidistant to both coasts. GRU's electric distribution facilities are not subject to storm surges and have limited exposure to flooding. In areas where there has been significant flooding in the past, GRU evaluates if electrical facilities should be moved or converted from overhead to underground to mitigate the impact of future flooding.

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

Electrical construction standards, policies, guidelines, practices, and procedures at GRU provide for the placement of new and replacement distribution facilities in a manner that ensures safe and efficient access for installation and maintenance.

GRU has instituted a Continuous Improvement Program. The reliability of each distribution circuit is analyzed monthly. When warranted, a plan is developed to improve the reliability of poor performing circuits once the root cause issue(s) has been identified. The work is prioritized based on the anticipated reduction of frequency and length of service interruptions as well as best value (cost/benefit) to be realized. The program also identifies the worst performing operating devices and most compromised primary voltage underground cable. Outages are reviewed on a daily basis to determine if any device has repetitive problems. The renewal and/or replacement of problem devices and cables are prioritized based on the anticipated customer service improvement and best value to be realized.

As part of this program, existing facilities which are difficult to access are evaluated to determine if they can be relocated. Historically, GRU has found it very difficult to relocate rear-lot facilities to the roadway due to the cost to convert to underground facilities in the front-lot, including the cost of relocating the customer's meter. Therefore, when it is not possible to relocate limited access facilities to a more accessible location, other solutions are developed to enhance circuit and operating device reliability. GRU has also integrated the use of motorized and non-motorized rear-lot construction and maintenance equipment to assist in the replacement and/or repair of limited access facilities. Also, long distribution laterals are reconfigured and shortened (segmented) when possible to further improve system reliability.

As mentioned above, the Continuous Improvement Program includes the evaluation of primary voltage underground cable performance and life expectancy. Specifically, direct buried cables are tested electrically and when viable, the cable insulation is restored

through chemical injection. During the testing phase all transformers and underground cable connections are checked, renewed or replaced as necessary. The program's goal is to extend the service life of the cables and supporting components by thirty years or more. Cables that fail the electric test are scheduled for replacement. The intent of this proactive program is to increase the life of older primary voltage cables and reduce the number of unplanned service interruptions due to cable burnouts. GRU resumed this program in April of 2015 and the program was completed in March of 2019. Presently, we are proactively replacing the primary conductors that were injected because the cables have begun to fail after two years. No future injection projects are upcoming as most cables are now installed in conduit.

Another element of the Continuous Improvement Program is the redesign of the mainline underground distribution system within GRU's most compact urban areas. With a focus on realizing increased system reliability and enhanced operability, problematic subsurface (manhole) switchgear have been replaced with surface-mount switchgear where feasible. None of these devices remain in the system.

GRU continues to advance its Supervisory Control and Data Acquisition (SCADA) distribution system re-closer program which enables the utility to monitor and reconfigure its distribution circuits automatically and remotely. These devices enable the utility to minimize the scope and duration of service interruptions by quickly and effectively isolating faulted circuit segments. GRU also started installing trip savers in 2020 as part of our reliability program.

GRU's transmission structure hardening program consists on improving roads and culverts to facilitate restoration in case of outages.

(e) Attachment by Others

Electrical construction standards, policies, guidelines, practices, and procedures at GRU include written safety, pole reliability, pole loading capacity, and procedures for foreign attachments by other entities to the utility's electric transmission and distribution poles. GRU requires pole attachment agreements for entities that desire to attach to its structures. The agreements stipulate that such entities must submit a permit request to GRU prior to making any attachments, with the exception of attaching a service drop cable. Whenever a pole proposed for joint use is of insufficient height or strength for the existing or proposed attachments, the pole is replaced. There is an additional requirement imposed on such entities to install whatever guy and anchor system is necessary to sustain any unbalanced load their attachment places on the structure. Some of GRU's pole attachment agreements require that the permit request include an engineer's determination that the impact of the proposed attachment will satisfy the applicable NESC requirements.

4. Facility Inspections

a) Policies, guidelines, practices, and procedures for inspecting transmission and distribution lines, poles, and structures.

GRU has had a comprehensive and periodic pole inspection/treatment program since 1992.

Overview

- The inspection cycle has been established at eight (8) years.
- The inspection method is to sound and bore every wood pole greater than ten years of age and to perform a complete visual inspection of those poles for cracks, splitting and obvious decay.
- The pole base is exposed (where possible) to eighteen inches to inspect for indications of decay. Where such exposure is not possible, the pole is treated with MITC-fume, a pesticide that will migrate throughout the pole to prevent rot, decay and insect damage.
- Pole treatment is documented by pole inspection program maps and in electronic data files.

Transmission

GRU visually inspects all transmission lines for vegetation danger trees twice each year and following major storm events. GRU has detailed inspection and ground line treatment performed on all wood transmission poles following an eight-year cycle. The inspection and treatment of those poles consists of a sound and bore to locate unseen decay pockets and a full visual inspection. The ground line inspection includes exposing the pole to a depth of eighteen inches below ground line. After inspection, any decay is removed and a preservative paste is applied to prevent future decay. Transmission lines are also treated with MITC-fume to prevent internal decay as well. MITC-fume is a pesticide that migrates throughout a pole to prevent rot, decay and insect damage. Visual inspections also provide information about other items such as damaged hardware, woodpecker holes, cracks, splits and decayed pole tops. GRU replaces all rejected poles within one year of the inspection date. Rejected poles determined to be a "priority" are replaced immediately.

Distribution

GRU performs a detailed inspection and ground line treatment on all wood distribution poles ten years of age or older on an eight-year cycle. The inspection and treatment of these poles consists of sound and bore to locate unseen decay pockets and a full visual inspection. The ground line inspection includes exposing the pole to a depth of eighteen inches below ground line where possible. After inspection, any decay discovered is removed and a preservative paste is applied to prevent future decay. Distribution poles that cannot be fully ground line inspected are treated with MITC-fume to prevent internal decay. Visual inspections also provide information on other problems such as damaged hardware, woodpecker holes, cracks, splits and decayed pole tops. GRU replaces all rejected poles within one year of the inspection date. Rejected poles determined to be a "priority" are replaced immediately.

b) Number and percentage of transmission and distribution inspections planned and completed for 2020.

No Transmission Poles were inspected in 2020. With regard to distribution, 4,116 poles were inspected with 52 rejects (1.26% reject rate). GRU completed 100% of planned work for 2020.

c) Number and percentage of transmission poles and structures and distribution poles failing inspection and the reason for the failure.

Of the 4,166 distribution poles inspected, 52 were identified for replacement (reject rate 1.26%). The replacements were caused by shell rot, mechanical damage, exposed pocket, enclosed pocket, split top, woodpecker holes and decayed tops. The low rate of rejected poles shows the benefits of our constant pole inspection program.

d) 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, including a description of the remediation taken.

Transmission Poles
No remediation was needed.

Distribution Poles

Height/Class	# in class	% of total	Remediation
30/5	1	2%	Replacement completed
30/6	13	25%	Replacement completed
35/3	2	4%	Replacement completed
35/4	2	4%	Replacement completed
35/5	13	25%	Replacement completed
35/6	2	2.5%	Replacement completed
40/2	1	2%	Replacement completed
40/3	2	4%	Replacement Completed
40/5	1	2%	Replacement completed
45/3	2	4%	Replacement completed
45/4	7	13.5%	Replacement completed
45/5	1	2%	Replacement completed
50/3	5	10%	Replacement completed
TOTALS	**52**	**100%**	

5. Vegetation Management

a) 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.

GRU's Vegetation Management work group establishes and maintains the clearances required to reliably operate approximately 560 miles of overhead distribution lines on a three-year rotating cycle. The work plan each year is defined, scheduled and executed by specific distribution circuits which range in size from approximately two to twenty-five miles in length. The prioritization of these circuits is based upon reliability and visual inspections. GRU completed its ninth maintenance cycle in 2016. The vegetation management program includes the maintenance of primary, secondary and service drops. The utility also has an aggressive herbicide program to reduce the density of undesirable vegetation as well as a tree growth regulator program to address specific problems. As much as it is possible to identify potentially hazardous trees from beyond the limits of the right-of-way/easement, GRU has a program to work with property owners to remove problem trees and provide the owner with a voucher redeemable for low growing species if need be.

The distribution vegetation maintenance program is based upon nationally recognized standards of tree care and vegetation management practices and adapted to Gainesville's environment and specific operating concerns. These standards and practices include, but are not limited to, the following:

- National Electric Safety Code
- ANSI A300 (Tree care - standard practices)
- ANSI Z133.1 (Tree care - safety practices)
- Shigo - Pruning trees near electrical utility lines
- Shigo - Tree Pruning
- Matheny and Clark - Evaluation of hazardous trees in urban areas

Components of the distribution maintenance program are:

- Routine utility tree pruning
- Selective tree removals based upon hazardous conditions
- Selective use of herbicides
- Selective use of tree growth regulators
- Wood chip recycling

Appropriate Planting

GRU advocates "Planting the Right Tree in the Right Place".

GRU maintains a number of different types of ground level electric facilities, and the two the utility is most concerned with are switchgear and pad-mount transformers. It is imperative that customers do not plant shrubs and small trees directly in front of these facilities. Each facility has a decal that informs the public of the required clearance with regard to the planting of trees and landscaping activities.

GRU has also developed a set of tree planting guidelines to be used by developers and engineers to keep trees and landscaping a specified distance away from the utility's facilities. GRU collaborates with the city, Alachua County, landscape architects and developers to inspect and review development plans to ensure "right tree, right place" and provide a safe and reliable utility system for the future.

The City of Gainesville enjoys an especially dense tree canopy, one that is clearly favored by the community and its citizens. As a neighbor and responsible municipal electric utility, GRU has long acknowledged its obligation to serve its customers in the most effective and least intrusive manner. Consequently, the utility's ratio of underground to overhead electric distribution facilities is among the highest in the State.

GRU's Vegetation Management program was developed over time with a care and control agenda that has been recognized as a model program for electric utilities. GRU records and continually monitors vegetation-related service interruptions. Tree-related outages are recorded in one of three categories:

1) **Tree Preventable** – vegetation to be maintained within our easements
2) **Tree Non-Preventable** – vegetation from outside of our easements
3) **Vines** – The growth rates of vines can be variable and unpredictable. To complicate matters, the conductive tissue of a vine's vascular system can transfer electrical current – and be the primary cause for an outage, service interruptions, or serious injury.

Transmission Program

GRU was the subject of a North American Electric Reliability Council (NERC) performance and readiness audit in April 2006 where GRU's Vegetation Management Program received a Potential Example of Excellence (PEOE).

Their report stated, *"GRU has a well-documented and comprehensive vegetation management policy, program and knowledgeable staff. The GRU vegetation management program and staff oversight is identified as a potential example of excellence for its comprehensive, detailed procedures and performance of the program itself."*

An FRCC Spot Audit was conducted in the latter half of 2009. The results found the vegetation management program was in compliance with all requisite requirements.

b) Quantity, level, and scope of vegetation management planned and completed for transmission and distribution facilities.

GRU's transmission and distribution right-of way maintenance of vegetation is a routine and on-going, year-round program. This is accomplished through the use of a utility approved contractor directed and inspected by GRU's Forestry professionals and Utility management staff.

Transmission System Information
76.2 corridor miles @138 kV
2.5 corridor miles @ 230kV (falls into NERC Standard FAC-003-1)

GRU applies NERC Guideline FAC-003-1 over our entire transmission system.

Transmission Inspections

The program calls for semi-annual inspections (spring and fall) to identify conditions which would pose a near-term threat to the operation of the system such as insect infestations or any other factor that would impact tree mortality or structural integrity. The program also calls for a complete inspection immediately following any significant events such as hurricanes, tornadoes or fires.

Inspections cover 100% of GRU's transmission system and are conducted by Vegetation Management personnel.

Spring 2020 Inspection Summary:
Inspected – 100% of Transmission system.
Results – 10 trees were identified for trimming and 15 for removal.
Follow-up activities – Work orders issued and completed by contract tree crews, post checked by GRU Forester

Fall 2020 Inspection Summary:
Inspected – 100% of Transmission system.
Results – 0 tree were identified for trimming and 17 for removal.
Follow-up activities – Work orders issued and completed by contract tree crews, post checked by GRU Forester.

Transmission Maintenance

GRU adhered to a five-year transmission system floor maintenance cycle in 2020. The floor of the transmission system was mowed twice. 25 miles of Transmission corridor was reclaimed, clearing the edges to the legal easement. The Transmission corridor floor was also maintained by scheduled herbicide spot applications which were selective and targeted to those species which are capable of growing to a mature height and could interfere with the transmission system conductors. The program was designed to incorporate the research from Bramble and Burn's Game lands 33 project which was a long-term study on rights-of-way treatments as well as Project Habitat principles and ANSI A300 Part 7 Integrated Vegetation Management for Electric utilities Rights-of-way.

Distribution Maintenance

GRU maintained its cyclic distribution system maintenance cycle in 2020 and trimmed approximately 200 miles of programed work in accordance with our cyclic trimming program. Additional emphasis is being placed on hazard trees that are located out of our easements and right-of-ways as well as using various herbicides and growth regulators to increase trimming effectiveness.

Summary

GRU's cycle-based line clearance practices embrace the philosophy of storm hardening on critical feeders, double circuits and three-phase backbone circuits. The utility uses best practices which include targeting dead, diseased or damaged trees, the removal of overhanging branches and increased tree clearance. Out-of-cycle activities include frequent patrols and year-round monitoring and targeting of danger trees. GRU

continuously reviews and improves its vegetation maintenance programs. This effort is realized in part by evaluating and using information presented in forums such as the Public Utility Research Center vegetation maintenance conference which was held January 26-27, 2009. That report was made available to GRU by the FMEA.

6. Storm Hardening Research

GRU 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 Amy Zubaly, Interim Executive Director, FMEA, 850-224-3314, ext. 7 or mailto:AZubaly@PublicPower.com