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Monday, February 11, 2019

PSC 25 – 6.0343

Municipal Electric Utility and Rural Electric Cooperative Reporting Requirements

Withlacoochee River Electric Cooperative, Inc.

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Billy E. Brown, Executive V.P. & General Manager

1) Number of meters served in calendar year 2018

229,954 (Services in place - December 2018)

2) Standards of Construction

a) National Electric Safety Code Compliance

All electrical facilities constructed by Withlacoochee River Electric Cooperative, Inc. on or after January 1, 2017, will comply with the 2017 edition of the NESC; facilities constructed prior to this date comply with the edition in effect at the time of the initial construction.

Withlacoochee River Electric Cooperative's (WREC) Specifications and Drawings for 14.2/24.9 KV Overhead and Underground Distribution Line Construction are based on RUS bulletins, drawings and engineering specifications. All of those specifications meet or exceed the requirements of the National Electrical Safety Code (ANSI C-2) [NESC]. Due to the nature of capital funding from the Department of Agriculture (RUS), WREC is held accountable to a very comprehensive set of Federal guidelines (including the NESC). A Construction and Operations Manual was created and distributed to all line crews, supervisors, and

other affected employees. Lines, cables and related equipment are installed and maintained according to these manuals, and both are used in the training program registered with the State of Florida. All field staking technicians have been trained in, and have access to, software that verifies NESC construction compliance. This Pole Foreman software is based on specific WREC design templates that include framing guides and corresponding material specifications. The program will calculate strength capabilities and clearances of specified spans, and compare results to the minimum NESC requirements (Grade C, B and Extreme Wind Loading).

b) Extreme Wind Loading Standards

WREC facilities are not designed to be guided by the “extreme wind loading standards” on a system wide basis. However, most new construction, major planned work assigned on or after December 10, 2006 and targeted critical infrastructure meets design criterion that comply with standards of construction for the wind loading projections in our service area. The NESC extreme wind loading standards are being considered for major distribution feeders. The difficulty in this consideration is the impact of joint use facilities. The concept of allowing joint use of overhead electrical distribution facilities is beneficial to all concerned, including the resulting pricing efficiencies for all affected Customers. Allowing multiple or large diameter cable attachments makes compliance with the extreme wind loading standards economically and aesthetically impractical due to the drastic reduction of span lengths.

c) Flooding and Storm Surges

Storm surge effects on WREC’s underground distribution facilities and supporting structures have been evaluated and for several years all pad mounted equipment, transformers, switchgear, etc., is specified with stainless steel construction. This requirement helps mitigate the need for premature replacement due to coastal erosion and high surge salt water intrusion.

We will continue to monitor all relative studies through the Florida Electric Cooperative Association and we will adjust our design standards accordingly. We strongly believe that it is essential to maintain current practices until we are able to thoroughly evaluate the results of current studies so that a cost/benefit can be established for conversion of overhead to underground.

All underground system designs include conduit installation for all primary and secondary cables, to both lengthen the life of the cable and shorten replacement times.

Additionally, WREC was the first Cooperative in the U.S. to receive RUS approval for

cost capitalization of the rehabilitative "cable-cure" process. This process prolongs the useful life of the cable and drastically reduces outages associated with cable failures. EPR (Ethylene-Propylene-Rubber) insulated cable is used exclusively for all underground primary distribution installations. Compared to standard cross-linked polyethylene insulation, EPR has a proven superior life span. All primary cables are also fully jacketed and strand-filled for additional long term reliability.

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

In 2018 WREC relocated approximately 120 miles of overhead primary lines from rear lot lines to the street, changing out hundreds of older poles and facilities. This practice will continue until all of the older areas have been upgraded.

e) Attachments by Others

All joint use attachment requests are evaluated on a case by case basis. Joint use companies send a written request to attach to WREC's poles. Each request is evaluated as to loading and clearance requirements per the NESC and Pole Foreman software (referenced in 3(a) above). WREC has extensive written and signed joint use agreements on file with each joint use company that specify compliance with the NESC and Rural Utilities Services (RUS) requirements, specifications and drawings. Such items as placing, transferring, or rearranging attachments, erecting, replacing, or relocating poles are specifically addressed to meet all requirements as per the NESC and RUS.

4. Facility Inspections

- a) *Description of policies, guidelines, practices and procedures for inspection transmission and distribution lines, poles and structures including pole inspection cycles and pole selection process.*

WREC utilizes well over 250 full time personnel to constantly monitor conditions and we are continuously developing realistic practices to evaluate the integrity and condition of our system as a whole. The group mentioned here consists of a combination of Operations and Engineering employees who are charged with the duty of line patrols while in the normal course of their daily work. Additionally, circuits and line segments having decreased performance are identified through data obtained with our Outage Management System and specific inspections are assigned accordingly. Annually, thousands of Service Orders are initiated, processed, and the appropriate corrective action is taken.

With over 7,100 miles of overhead distribution lines, a considerable portion of WREC's system is physically checked annually according to the following methods:

Line Patrol	906 Miles
Voltage Conversion	105 Miles
Rear to Front Relocation	120 Miles
Right-of-Way	1,437 Miles
S.T.A.R. ¹	371 Miles
Total	2,939 Miles (Approximate for year 2018)

- b) *Transmission and distribution inspections planned and completed*

WREC owns and maintains sixty-eight miles of transmission line with voltages of 69KV and 115KV.

All of the transmission feeders are patrolled semi-annually by walking, riding or aerial patrol and any issues found are given top priority.

Distribution lines inclusive of lateral taps and services are annually inspected according to procedures described in the response to question (4. a) above.

¹ Strategic Targeted Action and Repair. Selected areas of our system are targeted for intense line maintenance and repair according to information obtained by various methods including customer service issues, service interruption data, etc.

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

Distribution poles are visually inspected at the time line inspections are performed. Additionally, poles are visually inspected, including sounding and checking below ground level, during voltage conversion and maintenance programs; subsequently changed out as necessary.

WREC utilized a contractor (OSMOSE) for pole inspection and treatment during 2003-2004. They found 6.2% pole rot and 1.0% pole rejection. A decision was made at that time to discontinue that type of inspection/treatment plan, due to the fact that the majority of our wooden poles are CCA, having a life expectancy well in excess of 20 years, with no known instances of ground line decay. The poles with older treatments are being systematically changed out.

Data is unavailable on exact failure rates. WREC is systematically changing out all of the wood poles treated with anything other than CCA through an aggressive voltage conversion program, relocation of rear lot line facilities and routine system maintenance. Many polymer and steel distribution poles have been installed throughout the system in an effort to test what appears to be emerging changes to the wood pole philosophy.

- 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.*

Attached is a summary of size/class of distribution/transmission poles installed and removed in 2018. (Detailed data is not available, but WREC is exploring options to capture requested data for future years)

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.*

In the early part of 2017 WREC contracted with an arborist company (ACRT) who performed a total system vegetation analysis and assisted with the implementation and monitoring of a very aggressive Vegetation Management Program (VMP). ACRT is contracted for the duration of this four year program which is inclusive of problem tree removal, increased horizontal and vertical clearances and under-brushing to ground level.

WREC fully understands the objectives of the PSC with respect to a three year trim cycle, but WREC has in fact implemented measures to extend trim cycles; not shorten trim cycles. The ultimate objective is to control vegetation growth before it causes line related problems. WREC will accomplish this through the VMP and by well documenting vegetation growth/trim cycles for every transmission and distribution line segment. The thought process is by extending clearances, trim periods are extended. Certainly, desired clearances are not always obtainable, but these problem areas are being identified, monitored and addressed as needed.

WREC maintains over 180 overhead feeder circuits (over 7,100 miles of line). The current trim cycle is between four and five years. A few feeders, due to the type of soil conditions, have been cut more often because of a faster growth rate in those particular areas. Specific areas, according to customer service issues, outage reports and other statistics are trimmed in spots (Hot Spotted) which addresses “cycle busters”.

Data relevant to right of way issues is extracted from our outage management system (OMS) for prioritizing circuit trimming. When circuit trimming is performed all lateral taps and services are trimmed. Additional right of way issues are identified by line patrols, employees, contractors and consumers. Whenever the company is notified of any right of way issue a “service order” is initiated. During 2018 WREC addressed 4,472 right of way service orders ranging from trimming a single account to trimming an entire subdivision/area.

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

All transmission lines are inspected semi-annually and associated right of way issues are considered top priority and addressed immediately (2018 = 4.5 miles of transmission right of way trimmed).

PSC Data Request to Florida Municipal Electric Utilities and Rural Electric Cooperative Utilities

(Subject: 2018 Electric Distribution and Transmission Service Reliability)

Withlacoochee River Electric Cooperative, Inc.

For the data requests appearing below, please use the following definitions for the measure of reliability performance at the distribution system or the transmission system level. If your company uses a different definition, please specify.

(a) Service Interruptions (CI) - the loss of service to retail customers that lasts one minute or greater due to unplanned events within the distribution system or the transmission system.

(b) Customers (C) - The total number of retail customers (meters) served by the utility at the end of the reporting period (2018).

(c) Customer Minutes of Interruption (CMI) - The total number of minutes of interruption of retail customers within the total system.

(d) CAIDI (Customer Average Interruption Duration Index) - The average time to restore the service interruptions to interrupted retail customers within a system for 2018. CAIDI is calculated by dividing the customer minutes of interruption by the number of interrupted customers.

(e) SAIFI (System Average Interruption Frequency Index) - The average number of service interruptions per retail customer within a system for 2018. It is calculated by dividing the Service Interruptions (CI) by Customers (C).

(f) SAIDI (System Average Interruption Duration Index) - The average minutes of service interruption duration per retail customer served within a system for 2018. Mathematically, SAIDI is CMI divided by C.

(g) CEMI (Customers Experiencing Multiple Interruptions) - The percentage of customers (C) that have experienced more than a specified number of interruptions. For example, CEMI5 reports the percentage of customers experiencing more than 5 interruptions.

(h) MAIFIE (Momentary Average Interruption Event Frequency Index) - The average number of Momentary Interruption events (loss of continuity of less than one minute) recorded at substation breakers. A momentary interruption event is one or more momentary interruptions recorded within a five-minute period.

I. Data Requests Regarding Distribution Reliability (1 through 6) - For utilities which do not own distribution infrastructure, please respond "Not Applicable" or "N/A".

1. Please provide C, CAIDI, SAIDI, and SAIFI for your company's distribution system in 2018.

C = 218,440

CAIDI = 70.53

SAIDI = 121.61

SAIFI = 1.72

2. Please provide CAIDI, SAIDI, and SAIFI for each named storm that was excluded from the calculation of the system reliability indices provided in response to Question 1.
Zero named storms caused service interruptions that exceeded the T-Med threshold (SAIDI=10.69856) and were considered Major Event days.
CAIDI = 0
SAIDI = 0
SAIFI = 0
3. Please provide CAIDI, SAIDI, and SAIFI for those events other than named storms that were excluded from the calculation of the system reliability indices provided in response to Question 1. Please describe the types of events and reasons for exclusion.
POWER SUPPLIER
CAIDI = 67.54
SAIDI = 6.88
SAIFI = 0.11
SCHEDULED MAINTENANCE & CONSTRUCTION – Planned outages are excluded.
CAIDI = 99.76
SAIDI = 1.85
SAIFI = 0.02
4. Please provide MAIFIE for your company's distribution system in 2018.
Not Available, WREC does not track MAIFIE.
5. Please provide MAIFIE for all events that were excluded from the calculation of the MAIFIE provided in response to Question 4. Please describe the types of events and reasons for exclusion.
Not Available, WREC does not track MAIFIE.
6. Please provide any other measures that your company uses in tracking outage trends and system reliability goals, including any type of CEMI (such as CEMI5) for 2018.
Not Available, WREC does not track other outage trends beyond those described above.

II. Data Requests Regarding Transmission Reliability (7 through 9) – For utilities which do not own transmission infrastructure, please respond “Not Applicable” or “N/A”.

7. Please provide SAIDI, SAIFI, and CAIDI for your company's transmission system in 2018.
One outage was experienced on WREC owned radial transmission in 2018. WREC does not own Any “looped” or grid configured transmission.
CAIDI = 51.00
SAIDI = 0.71
SAIFI = 0.01
8. Please provide SAIDI, SAIFI, and CAIDI for each named storm that was excluded from the calculation of the system reliability indices provided in response to question 7.
N/A
9. Please provide SAIDI, SAIFI, and CAIDI for those events other than named storms that were excluded from the calculation of the system reliability indices provided in response to question 7. Please describe the types of events and reasons for exclusion.
NO planned outages were experienced on WREC's transmission in 2018. Power supplier (Progress Energy) outages are spread across the distribution circuits affected.

III. Overhead (OH) vs. Underground (UG) Questions (10 through 12)

10. Please provide the number of Overhead (OH) and Underground (UG) retail customers for your company at year-end 2018. How does your company determine whether a retail customer is served by OH or UG system?

Not Available, WREC does not categorize retail customers by OH or UG.

11. Please provide an estimate of the number of customer interruptions for OH and UG systems in 2018 and, if available, show the breakout of such data for named storms event periods (combined) and non-named storm periods.

Not Available.

12. Please provide an estimate of the minutes of customer interruptions for OH and UG systems in 2018 and, if available, show the breakout of such data for named storms event periods (in sum for all such periods) and non-named storm periods.

Not Available.

END

WITHLACOCHEE RIVER ELECTRIC COOP., INC.

2018

Asset Description	Construction	Retirement
POLES, FIBERGLS/COMPOSITE 40FT	2	1
POLES, FIBERGLS/COMPOSITE 50FT	1	1
POLES, STEEL 45' LIGHT DUTY H2	3	0
POLES, STEEL 55' LIGHT DUTY H2 & H4	2	0
POLES,CEMENT 50FT.	10	1
POLES,CEMENT,35'& UNDER	34	2
POLES,CEMENT,40'& 45'	52	18
POLES,CONCRETE 55FT	2	0
POLES,CONCRETE 60FT	3	0
POLES,STEEL 50' RD &LD H1 GALV	60	1
POLES,STEEL 60-65" LGHT DTY H2	20	0
POLES,WOOD 60FT	0	6
POLES,WOOD,35'& UNDER	1373	1855
POLES,WOOD,40'& 45'	2118	1170
POLES,WOOD,50'& OVER	660	182
POLES, ALUMINUM 12'	534	12
POLES,ALUMINUM, 14'	36	0
POLES,ALUMINUM, 15'	1	1
POLES,CEMENT,40'& 45'	39	4
POLES,CONCRETE,35' & UNDER (B)	13	0
POLES,CONCRETE,35'& UNDER	110	46
POLES,18' FIBERGLASS	120	121
POLES,WOOD,35'& UNDER	526	309
POLES,WOOD,40'& 45'	0	1
POLES, WOOD 70-80 FT	0	1
POLES,WOOD,75'	0	18
POLES,WOOD,85'	0	11
POLES,WOOD,95'	0	3
POLES, STEEL 100'TANG 0-5 0-7D	3	0
POLES, STEEL 75' ANG 15-30D	1	0
POLES, STEEL 95' TANG 0-5D	16	0
POLES, STEEL 95' ANG 5-15D	2	0
POLES, STEEL 85' TANG 0-5D	1	0
POLES, STEEL 90' ANG 5-15D	1	0
POLE, STEEL 90' TANG 0-5D	22	0
POLES, STEEL 100' TANG 5-15D	2	0
POLES, STEEL 95-100' DE 50-90D	4	0
	5771	3764

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 2019

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 2018.

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 was contacted by the Government of 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 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. In addition, PURC has been contacted by California stakeholders interested in applying the principles of the model to the prevention of wildfires. 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

In last year's report we discussed the impact of increasingly severe storms 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 Connecticut, New York, and New Jersey,

Pennsylvania, and regulators in Jamaica, Grenada, Curacao, Samoa, and the Philippines. In 2018, 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 2018, there was considerable interest in Florida's hardening efforts from the popular media in California, in light of the wildfires plaguing the state.

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.