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UTILITY BOARD OF THE CITY OF KEY WEST

February 16, 2021

Penelope Buys
Florida Public Service Commission
Sent via e-mail to pbuys@PSC.STATE.FL.US

RE: Storm Hardening Report for Keys Energy Services pursuant to
Rule 25-6.0343, FAC for 2020

Dear Ms. Buys:

Pursuant to Rule 25-6.0343, Florida Administrative Code, attached is the 2020 Storm Hardening Report for the Utility Board of the City of Key West dba Keys Energy Services (KEYS).

If any questions develop during your review, please do not hesitate to contact me at 305.295.1041.

Sincerely,

A handwritten signature in blue ink, appearing to read "Dan Sabino", written in a cursive style.

Daniel J. Sabino
Director of Engineering & Control Center
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DS/cdc

Copied via electronic mail:

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M. Alfonso, Supervisor of Engineering
G. Castellon, Supervisor of T&D
J. Diaz, Supervisor of T&D
Amy Zubaly, FMEA Executive Director

1) Introduction

a) Utility Name: The Utility Board of the City of Key West, Florida
dba Keys Energy Services (KEYS)

b) Address: 1001 James Street
P. O. Box 6100
Key West, Florida 33040

c) Contacts: Lynne Tejada, General Manager/CEO
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NOTE: This report was developed by Dan Sabino.
For questions and/or clarifications, please contact
Dan Sabino at 305.295.1041.

2) Number of Meters Served in Calendar Year

a) **December 2020:** 30,908 Meters

3) Standards of Construction

a) National Electric Safety Code (NESC) Compliance:

- KEYS current construction standards, policies, guidelines, practices and procedures comply with the NESC 2017 (ANSI C-2). For electrical facilities constructed on or after January 1, 2017, the 2017 NESC applies.
- KEYS electrical facilities constructed prior to January 1, 2017, are governed by the edition of the NESC in effect at the time of the facilities' initial construction.

b) Extreme Wind Loading Standards:

- KEYS is in compliance with the 2017 NESC "Extreme Wind Load" requirement for KEYS' Distribution System for major planned work, including expansion, rebuild, facilities or relocation of existing facilities, signed on or after December 10, 2006.

c) Flooding and Storm Surges:

- KEYS Construction Standards, for underground construction, have always incorporated the elevation of switches, padmount transformers, and substation equipment to the "FEMA Flood 100 Year Elevation" in order to prevent electrical damage due to storm surge and flooding. This long-standing policy for over 30 years, proved to be very successful during Hurricane Wilma in 2005 and Hurricane Irma in 2017. No substantial damage occurred to KEYS underground system or substations as a result of flooding due to this longstanding construction standard.

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

In order to comply with the Florida Public Service Commission's Order 25-6.0341 which states "in order to facilitate safe and efficient access for installation and maintenance, to the extent feasible, and cost-effective, electric distribution facilities shall be placed adjacent to a public road, normally in front of the customers' premises," KEYS developed a program with a long-term goal of constructing all electrical facilities adjacent to public roads and removing all facilities that are currently in inaccessible locations. The Utility Board and the City of Key West approved a three-year program to relocate facilities to a more accessible location.

KEYS completed Phase I of the program 2018. This included relocation of all primary distribution high voltage facilities from inaccessible easements to accessible locations adjacent to public roads within the City of Key West. KEYS completed Phase II of this program in 2019. This included relocation of high voltage facilities from inaccessible easements to accessible locations outside the City of Key West.

KEYS is in the process of completing relocation of Customer secondaries to be served from the relocated primary facilities.

e) Attachments by Others:

Electrical construction standards, policies, guidelines, practices, and procedures at KEYS include written safety, pole reliability, pole loading capacity, and engineering standards and procedures for attachments by others to the utility's electric transmission and distribution poles. KEYS inspects these attachments on an eight-year cycle

4) Facility Inspections

a) KEYS Policy, Guidelines, Practices and Procedures as they relate to Pole Testing:

Distribution Poles-

- KEYS elected to test all poles for NESC compliance
- KEYS is maintaining an 8-year inspection cycle, but electing to test 50% of its poles every 4-years.
- Testing is performed by a contractor. Osmose Utilities Services, Inc. was awarded the last bid.

- Osrose Utilities Services, Inc. performed the tasks below:

Item #	Task Description
1	Site visit and visual inspection of pole (concrete and wood)
2	Sound and bore test for wood
3	Excavated base - soil around wood pole -- Reject pole
4	Excavated base - soil around wood pole -- External treat
5	Excavated base - soil around wood pole -- External treat, then reinforce using cost items below
6	Internal treat of wood pole
7	Difficult accessible (poles located in rear lot lines)
8	Ground wire repair near pole base
9	Load calculation assessment per pole as per PSC
10	Digital images/photos for reject poles and code problems in items (18,19 and 20)
11	Computerized report of task performed per pole (includes 3 copies of software)
12	Install "Guy Guard" on Down Guy
13	Osrose C2 external steel reinforce installation at base (35' wood pole) (All labor and material)
14	Osrose C2 external steel reinforce installation at base (40' wood pole) (All labor and material)
15	Osrose C2 external steel reinforce installation at base (45' wood pole) (All labor and material)
16	Down guy wire and anchor rod inspection (6" below grade)
17	Identify/document locations of missing KEYS' pole # on the pole
18	Identify/document locations that the "pole ground rod" extends above grade/ground
19	Identify/document ADA non-compliance (b/w pole and any object) if clearance is lower than 33" (on sidewalks).
20	Identify/document locations that clearance between pole and fire hydrant is - less than four feet (at ground level).
21	Identify/document locations where clearance b/w OH wire and structure is less than 10 ft. (overhead).
22	Joint Use Survey of two other utility attachments (for each of the foreign attachments).

Transmission Poles-

- KEYS has no "wood" transmission poles.
- KEYS has only one incoming transmission line into its service territory. This is a combination of concrete and metal poles.
- An aerial inspection is performed every two years.
- Infrared survey - KEYS performs a 100% infrared inspection every two years.

b) Number and Percentage of Transmission and Distribution Pole Inspections planned and completed:

Distribution Poles

- KEYS contracted Osmose Utilities Services, Inc. in 2020 to
 - visually inspect 100% of KEYS utility poles
 - sound and bore wood poles in 50% of its service territory

Transmission Facility Inspections-

- Aerial inspection - 100% inspected in 2019.
- Aerial inspection sub transmission (69kv) - 100% inspected in 2017.

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

- Transmission & Sub Transmission-
 - Number of poles failed (rejected) -0.0
 - Percentage of rejected failed rate -0.0%
- Distribution-
 - See detail summary table below.

Pole Testing Summary Distribution - Testing 2020			
Test Area	KEYS Energy	AT&T	Combined Totals

Total Poles Tested	11451	1839	13290
Total Concrete Poles Tested	5826	344	6170
Total Ductile Iron Poles Tested	1336	67	1403
Total Wood Poles Tested	4289	1428	5717
Total Pole Visually Inspected	11451	1839	13290
% of Total Poles Tested	100%	100%	100%

Reject/Failed Pole Summary			
Total Concrete Rejects	44	1	45
% of Total Concrete	0.8%	0.3%	0.7%
Total Wood Pole Rejects	144	119	263
% of Total Wood	3.4%	8.3%	4.6%
Total Ductile Iron Pole Rejects	0	0	0
% of Total Ductile Iron	0.0%	0.0%	0.0%

Reject/Failure Reasons			
Decayed Top	54	24	78
% Decayed Top	28.7%	20.0%	25.3%
Excessive Cracking	17	3	20
% Excessive Cracking	12%	3%	6%
Hollow	4	0	4
% Hollow	2.1%	0.0%	1.3%
Mechanical Damage	23	2	25
% Mechanical Damage	12.2%	1.7%	8.1%
Rotten/Shell Rot	68	62	130
% Rotten/Shell Rot	36.2%	51.7%	42.2%
Shell Rot Above	3	1	4
% Shell Rot Above	1.6%	0.8%	1.3%
Split Top	4	1	5
% Split Top	2.1%	0.8%	1.6%
Woodpecker Holes	13	27	40
% Woodpecker Holes	6.9%	22.5%	13.0%
Fire Damage	2	0	2
% Fire Damage	1.1%	0.0%	0.6%

d) Number and Percentage of T&D Poles Replaced and the Remediation Plan to Correct:

Transmission Facilities Plan-

- No transmission facilities failed inspection. Repair of concrete spalling on transmission pole structures and foundations was completed in 2019.
- KEYS has applied for Hurricane Irma Hazard Mitigation Grant to install lifejacket technology on concrete pole structures not currently exhibiting spalling with the intent of proactively preventing the spalling.

Distribution Facilities Plan-

- KEYS completed 100% visual inspection of all distribution poles in 2020, and testing of 50% of those same poles. KEYS will issue a bid for replacement of all reject poles in 2021. New poles will meet the extreme wind requirements.
- Additionally, KEYS was awarded a Pre-Disaster Mitigation Grant to accelerate the storm hardening program concentrating on poles that feed critical facilities.
- Approximately 27% of KEYS distribution poles have been replaced with poles that meet the extreme wind requirements.

5) Vegetation Management Program

Mission:

- Keys Energy Services (KEYS) is dedicated to maintaining safe clearances surrounding electrical facilities to reduce outages and increase the public's safety and awareness. This is achieved through various programs including, continuous zone trimming, tree safety press releases, Tree Give-A-Way, and by responding to Customer Service requests for vegetation management. The following information describes KEYS programs in greater detail.

KEYS Service Area:

- KEYS' service area consists of 241 OH & UG miles of 3 phase distribution lines & 68 miles of transmission lines.

KEYS Staff and Contractual Crews:

- KEYS has a total of four tree trimming crews, two in-house crews and two contractor crews. KEYS in-house crews maintain all customer request orders, revisit tree trimming list as well as zone trimming and tree removals. Contractor crews specifically work in zone trimming and tree removals. All work is compiled and documented; such as footage, tree removals, zone trimming and man-hours it takes to complete these zones.
- Crews have received special training in the line clearance tree trimming and follow arborist guidelines for utilities, which specify how trees should be cut. Industry standards specify the minimum safety clearances that must be maintained for safety and for reliability.

KEYS Trim Cycle Information:

- KEYS implemented a policy to maintain a two-year cycle for system trimming, which KEYS has been able to complete in this time frame. This two-year cycle has been in place since 2000, which includes trimming of all three-phase feeders, laterals, secondary and communication conductors.
- KEYS performs a quarterly maintenance of tree clearances on all the 68 miles of transmission lines and maintains these clearances.
- KEYS averages approximately six customer requests a day, the low volume of requests are due to the cycle trimming that is in place. KEYS in house crews spend approximately 85% of their time on customer-generated requests, which include service trims, communication and conductor trims. When not working on customer requests, the KEYS crews work on revisits and zone trimming.

- While zone trimming contractor crews as well as KEYS, tree crews remove all invasive trees in the right-of-way and easements. Trees are cut to ground level and sprayed with an herbicide to prevent re-growth.

Problem Trees Outside of Right-Of-Ways or Easements:

- For customer trees that are infringing into KEYS lines, KEYS makes contact with the customer and explains the safety issues that exist with a tree getting into high voltage lines. Most customers are receptive to the tree removal once contacted by KEYS.
- KEYS initiated a quarterly revisit list for the locations throughout the system where customer trees are infringing on KEYS lines and are not willing to have the tree removed. This revisit list was put in place in late 2006 and is working well. The quarterly revisit list is necessary due to KEYS' tropical climate and the substantial growth rate throughout the year.

Addressing appropriate planting and landscaping:

- KEYS has a tree give-a-way program that has been in place since 1995 to help promote energy conservation and public awareness. KEYS helps customers determine the proper placement of the tree to maintain adequate clearance from facilities with one-on-one consultation. KEYS personnel reviews a site layout of the customer's yard and advice on the best placement for shade benefit and proper clearance. During the consultation, KEYS gives the customer a brief summary of what type of problems may occur if a tree was to be placed under the high voltage lines/service drops. Generally, the customer agrees to plant the tree where KEYS indicates on the layout of the property resulting in fewer future tree-trimming problems and increases safety.

Benchmark Reports on Vegetation Management:

- KEYS implementation of the two-year trim cycle, revisit list, tree removals, tree give-a-way program, and public service announcements, responding to customer request and hiring contractor crews for zone trimming has allowed KEYS to reduce outages.
- KEYS maintains records and produce an annual report of all outages throughout the system. In 2020, KEYS had 3 feeder outages and 15 lateral outages due to vegetation. KEYS attributed 38 feeder recloses and 18 lateral outages to unknown causes. These proactive measures have resulted in the low number of occurrences due to KEYS Vegetation Management Program. KEYS will strive to continue to improve this program, further reduce outages, and increase safety to the public and KEYS employees.

LINE CLEARANCES

KEYS strives to maintain the following line clearances where practical as follows:

- 15 feet clearance on all transmission lines.
- 10 feet clearance on all open conductors greater than 600 volts (where possible).
- Five feet minimum clearance on all open conductors less than 600 volts (where possible).
- Three feet minimum clearance on all communication conductors.

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

6) Storm Hardening Research

Key West/Keys Energy Services 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, Executive Director, FMEA, 850-224-3314, ext-1, or azubaly@publicpower.com.