State of Florida

Public Service Commission

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TALLAHASSEE, FLORIDA 32399-0850

-M-E-M-O-R-A-N-D-U-M-

DATE: September 22, 2014

TO: Office of Commission Clerk (Stauffer)

FROM: Division of Engineering (P. Buys) PDB PV PB
Office of the General Counsel (Young) KCY JSC

RE: Docket No. 140082-EI – Petition for change to requirements of Order No. PSC-06-0144-PAA-EI regarding pole inspection and load assessment, by Florida Power & Light Company.

AGENDA: 10/02/14 – Regular Agenda – Proposed Agency Action – Interested Persons May Participate

COMMISSIONERS ASSIGNED: All Commissioners

PREHEARING OFFICER: Administrative

CRITICAL DATES: None

SPECIAL INSTRUCTIONS: None

Case Background

On February 27, 2006, the Commission ordered each electric investor-owned utility (IOU) to implement an eight-year wood pole inspection cycle and submit annual reports.[1] The Commission required each electric IOU to implement a pole inspection program utilizing the sound and bore technique for all wood poles and directed all electric IOUs to excavate the poles as appropriate per Rural Utilities Service (RUS) Bulletin 1730B-121. The Commission also ordered the electric IOUs to perform strength impact/load assessments on poles with attachments added since original pole installation.

[1] See Order No. PSC-06-0144-PAA-EI, issued February 27, 2006, in Docket No. 060078-EI, In re: Proposal to Required Investor-Owned Electric Utilities to Implement a Ten-Year Wood Pole Inspection Program.

On April 15, 2008, Progress Energy Florida, Inc. (PEF, now Duke Energy Florida, Inc., DEF), Florida Power & Light Company (FPL), and Tampa Electric Company (TECO) filed a joint petition seeking approval to deviate from the inspection requirements of Order No. PSC-06-0144-PAA-EI by discontinuing sounding and boring and excavation of chromium copper arsenate (CCA) wood poles less than 16 years of age. The utilities proposed to continue visual inspections as well as overload analysis on all CCA poles regardless of age. On September 23, 2008, the Commission granted the petition and required the companies to: sound and selectively bore all CCA poles under the age of 16 years, perform a full excavation sampling to validate their inspection methods, and provide sampling results with their annual distribution reliability reports.[2]

On April 18, 2014, FPL filed a petition seeking the Commission's approval to again deviate from the pole inspection requirements of Order No. PSC-08-0615-PAA-EI for CCA poles and the load assessment requirements of Order No. PSC-06-0144-PAA-EI. Specifically, FPL is requesting that the current exemption that applies to inspections of CCA poles less than 16 years of age be applied to poles that are less than 28 years of age. This request will be addressed in Issue 1. FPL is also requesting an exemption from the requirement to perform strength impact/load assessments during FPL's second eight-year pole inspection cycle on poles that had a load assessment of less than 80 percent during the first eight-year cycle. This request is addressed in Issue 2.

The Commission has jurisdiction pursuant to Sections 366.04 and 366.05, Florida Statutes (F.S.)

[2] See Order No. PSC-08-0615-PAA-EI, issued September 23, 2008, in Docket No. 080219-EI, In re: Joint Petition for authority to deviate from requirements of Order PSC-06-0144-PAA-EI regarding CCA wood pole inspections, by Progress Energy Florida, Inc., Florida Power & Light Company, and Tampa Electric Company.

Discussion of Issues

Issue 1: Should FPL be granted authority to deviate from the excavation requirements of Order No. PSC-08-0615-PAA-EI for chromium copper arsenate (CCA) wood poles less than 28 years old?

Recommendation: Yes. Based upon updated data, the failure rate (0.08 percent) for CCA wood poles less than 28 years old is the same as the failure rate the Commission relied upon in Order No. PSC-08-0615-PAA-EI. Consistent with Order No. PSC-08-0615-PAA-EI, FPL will continue to sound and selectively bore all CCA poles and perform sampling excavation of CCA poles less than 28 years of age. The results of the sampling will be included in FPL's annual distribution reliability reports. As such, reliability of FPL's system should not be compromised and FPL projects annual savings of $1.0 million. (P. Buys)

Staff Analysis: On September 23, 2008, the Commission granted DEF, FPL, and TECO authority to deviate from sounding and boring and excavation requirements of Order No. PSC-06-0144-PAA-EI with regard to CCA wood poles less than 16 years old as set forth by Order No. PSC-08-0615-PAA-EI. The Commission's decision at that time was based on the rejection rate of poles less than 16 years of age being only 0.08 percent.

FPL performs five different types of inspections on its wood poles. The inspections include: (1) visual inspection from ground line to the top of the poles (this inspection identifies visual defects such as woodpecker holes, split tops, and decay tops); (2) above ground line sound and bore inspections; (3) excavations with below ground line sound and bore inspections; (4) strength assessments (this inspection compares the current measured circumference to the original circumference); and, (5) load assessments (this inspection utilizes field measurements which are pole strength, span length, attachment heights, and wire sizes). The poles are also inspected during daily work activities (e.g., repairs, maintenance, and restoration) and during reliability program activities (e.g. priority feeder and overhead line inspections). FPL noted in response to staff's data request that even though it is seeking exemptions for two inspection types, every distribution pole in its system will continue to be visited and inspected using at least three of the five inspection types.

By not performing full excavation on CCA poles under 28 years, FPL noted that the estimated cost savings would be $1.0 million annually or $8.1 million over the second eight-year inspection cycle. FPL provided data, under a Request for Confidential Classification, on specific costs and time required to complete each type of inspection.[3] Staff reviewed this data and found that performing a full excavation inspection takes more time and costs more then the other types of inspections.

While reviewing FPL's 2014 Status/Update Report on Storm Hardening/Preparedness and Distribution Reliability, staff noted that FPL reported 12.8 percent or approximately 16,678 of its wooden poles failed inspection. Staff learned that 6,191 poles of the 16,678 poles that failed inspection in 2013 were CCA poles. Of the 6,191 CCA poles that failed inspection, 4,629 failed due to being overloaded, 1,246 failed due to above ground strength, and 316 failed due to

[3] See Document No. 04434-14 filed August 14, 2014.

below ground strength.[4] Excavation is used to determine below ground failures and this type of inspection identified the least amount of pole failures (5 percent) for 2013.

If granted the deviation, FPL would not be required to perform full excavation on 70 percent of its CCA poles. FPL assured staff that it would continue to sound and selectively bore all wood poles, no matter what the age or type and would continue excavation sampling on poles less than 28 years of age. FPL also noted that it would continue to sample one percent of its CCA poles, which staff recommends is appropriate. FPL noted in response to staff's data request that all CCA poles less than 28 years of age would be identified and segregated in categories by geographic area and by age. The one percent sample would be obtained from these categories to produce a random sample. FPL notes that current cost to perform the one percent sampling would increase by approximately $11,000 annually because the sample size would increase (1 percent of poles less than 16 years versus 1 percent of poles less than 28 years). The current cost is approximately $18,000, which would make the projected cost of the sampling approximately $29,000.

Table 1 provides a summary of the CCA pole data by age, first cycle failure rate by all types of failures, and percentage of total CCA poles. The data shows that the failure rates only increase by 0.01 percent between the CCA poles that are 27 to 30 years of age. However, for CCA poles greater than 28 years of age, the reliability starts to degrade. The failure rate of 0.08 percent is the same failure rate that the Commission relied upon in Order No. PSC-08-0615-PAA-EI, when it previously granted a deviation from existing sounding and boring and excavation requirements.

Table 1: Summary of FPL CCA Poles by Age, Failure Rate, and Percent of Total CCA Poles

Age of CCA Poles	1st Cycle Failure Rate	% of Total CCA Poles
<26	0.07%	62%
<27	0.07%	66%
<28	0.08%	70%
<29	0.09%	74%
<30	0.10%	78%

Table 2 provides a summary of CCA pole data by age, annual savings, and eight-year inspection cycle savings. The annual savings increases by $0.1 million for the CCA poles that are 26 through 30 years of age. The data shows that the incremental savings do not increase as the reliability decreases for CCA poles greater than 28 years of age.

[4] Above ground strength includes woodpecker holes, split/decayed tops, external decay, and internal decay. Below ground strength includes external decay and internal decay.

Table 2: Summary of FPL CCA Poles by Age, and Savings

Age of CCA Poles	Annual Saving (Millions)	8-year Cycle Savings (Millions)
<26	$0.8	$6.5
<27	$0.9	$7.2
<28	$1.0	$8.1
<29	$1.1	$9.0
<30	$1.2	$9.9

Based upon updated data, the failure rate (0.08 percent) for CCA wood poles less than 28 years old is the same as the failure rate the Commission relied upon in Order No. PSC-08-0615-PAA-EI. Consistent with Order No. PSC-08-0615-PAA-EI, FPL will continue to sound and selectively bore all CCA poles and perform sampling excavation of CCA poles less than 28 years of age. The results of the sampling will be included in FPL's annual distribution reliability reports. As such, reliability of FPL's system should not be compromised and FPL projects annual savings of $1.0 million. Therefore, staff recommends FPL be granted authority to deviate from the excavation requirements of Order No. PSC-08-0615-PAA-EI for CCA wood poles less than 28 years old.

Issue 2: Should FPL be granted authority to deviate from performing strength impact (load) assessments as required by Order No. PSC-06-0144-PAA-EI during the second eight-year pole inspection cycle with regards to any pole that had a load assessment of less than 80 percent of full load during the first eight-year cycle?

Recommendation: Yes. Based upon updated data, the probability of a pole failing a load assessment test during the second eight-year inspection cycle is projected to be 0.07 percent for poles that have a load assessment of 80 percent of full load during the first eight-year cycle. This failure rate is less than the failure rate the Commission relied upon in Order No. PSC-08-0615-PAA-EI and FPL has processes and procedures to address modification to poles during the second eight-year inspection cycle. As such, reliability of FPL's system should not be compromised and FPL projects annual savings of $528,000. (P. Buys)

Staff Analysis: On February 27, 2006, the Commission ordered each electric IOU to implement an eight-year wood pole inspection cycle. Order No. PSC-06-0144-PAA-EI, p. 9, states:

> Moreover, if an electric IOU does not maintain records of the strength impact assessments of pole attachments affixed to the pole after the time of original pole installation, poles with additional attachments shall be inspected for strength impacts in order to determine whether the IOU has complied with NESC (i.e., when new or changed facilities add load to existing structures, the strength of the structure when new shall have been great enough to support the additional loads). In those specific cases, this type of assessment shall be completed in addition to the wood pole sound and bore inspections in order to ensure that the pole is not overloaded.

FPL stated in its petition that it currently performs load assessment tests on all poles in order to determine if they meet the allowable load required by National Electric Safety Code (NESC) standards. During the first eight-year cycle, FPL performed load assessment tests on all poles because it did not have a consistent and comprehensive database on the existing loading of its poles. However, now that FPL has completed its first eight-year inspection cycle and performed an analysis in support of its request to deviate from current practice, FPL believes it has complete data.

FPL utilized an Excel spreadsheet that identified all the poles that were inspected during the first eight-year cycle. Using Excel's "RAND" function to generate a random number for each record, the records were sorted by the random number assigned and FPL chose the first 384 poles to test again. Staff reviewed the sample size and determined it is statistically valid considering it produces a 95 percent confidence level. The retesting of the poles showed that all poles with an original load assessment of less than 80 percent still passed the load assessment requirement. There were five poles that failed the load assessment retest. These poles had original loading assessments of 83, 88, 89, 96, and 99 percent full load.

FPL also used a Monte Carlo computer simulation to assess the risk of a pole not passing a load assessment test during the second eight-year cycle on poles that tested below 80 percent of full load during the first eight-year cycle. The Monte Carlo simulation used three main factors to determine the probability of a pole failing a load assessment test. The factors were: additional

attachments, reduced pole circumference, and communication over lashing. These factors are what caused five poles previously identified to fail during FPL's sample testing. The simulation, using these factors, generated 10,000 different outcomes. The Monte Carlo simulation results indicated that a pole that tests 80 percent full loading during the first eight-year cycle had a 0.07 percent probability of failing the load assessment test during the second eight-year cycle.

Staff asked FPL about its process and procedures to address poles that may be modified, as a result of equipment or additional attachments, during the second eight-year cycle. FPL responded that its pole attachment permit process requires the attaching entities to provide wind load analysis and calculations to demonstrate the pole would not be overloaded with the new attachment. If the analysis indicates the pole would be overloaded, the attaching entity would replace or upgrade the pole to meet the required load standards. FPL's joint use agreements include wind load standards and require that poles meet the NESC standards. FPL also noted that it has not had any issues with unauthorized third party attachers for the last three years. FPL does a field check after a new attachment is made to ensure the attachments were constructed with the approved attachment request. In addition, FPL stated it does new load calculations on any poles that FPL attaches new or additional facilities.

FPL estimated an incremental savings of approximately $528,000 annually or approximately $4.2 million over the second eight-year cycle if the deviation is granted. FPL believes the requested threshold is appropriate since it balances an extremely low risk with cost savings.

Table 3 below provides a summary of the data for poles with original load assessments from the first eight-year cycle, number of failures from FPL's sample testing, and second cycle failure probability using the Monte Carlo simulations. The number of failures from FPL's sample testing is zero between poles with original load assessments of 65 to 80 percent. The number of failures from FPL's sample testing increases when the poles have original load assessments above 80 percent. The second cycle failure probability is projected to be zero between poles with original load assessments of 65 to 75 percent. The second cycle failure probability projection increases to 0.07 percent when poles have original load assessments of 80 percent and continues to increase dramatically thereafter.

Table 3: Summary of FPL Poles by Original Percent Load Assessments, Number Failures from Sample Testing, and Second Cycle Failure Probability

% of Original Load Assessment	# of Failures from FPL's Sample Testing	2nd Cycle failure Probability
<65	0	0.00%
<70	0	0.00%
<75	0	0.00%
<80	0	0.07%
<85	1	0.22%
<90	2	0.69%
<95	2	1.52%

Table 4 provides a summary of the data for poles with original load assessments from the first eight-year cycle, annual savings by not inspecting those poles, and eight-year cycle savings. The annual savings increase by $0.1 million depending on the poles original load assessments. The eight-year cycle savings increase by $0.4 million at the most depending on the poles original load assessments.

Table 4: Summary of FPL Poles by Original Percent Load Assessments and Savings

% of Original Load Assessment	Annual Saving (Millions)	8-year Cycle Savings (Millions)
<65	$0.4	$3.2
<70	$0.5	$3.6
<75	$0.5	$3.9
<80	$0.5	$4.2
<85	$0.6	$4.5
<90	$0.6	$4.6
<95	$0.6	$4.8

Staff notes that the projected failure probability shows a slight degradation in reliability between 70 percent and 80 percent without any incremental savings. Staff believes FPL should continue to monitor the poles with an original load assessment between 70 and 80 percent and provide an update in its annual distribution reliability reports. FPL's current data shows that the probability of a pole failing if a load assessment test is not performed during its second eight-year cycle on poles that tested below 80 percent of full load during the first eight-year cycle is 0.07 percent. This failure rate is less than the failure rate the Commission relied upon in Order No. PSC-08-0615-PAA-EI. FPL has processes and procedures in place to address poles that may be modified during its second eight-year inspection cycle therefore reducing even further the risk

of an overloaded pole. Staff believes that reliability of FPL's system should not be impacted by not performing the load assessments test. FPL also estimated the cost saving, if granted the deviation, would be $528,000 annually or $4.2 million over the second eight-year inspection cycle. Staff recommends FPL's request is reasonable and should be granted.

Based upon updated data, the probability of a pole failing a load assessment test during the second eight-year inspection cycle is projected to be 0.07 percent for poles that have a load assessment of 80 percent of full load during the first eight-year cycle. This failure rate is less than the failure rate the Commission relied upon in Order No. PSC-08-0615-PAA-EI and FPL has processes and procedures to address modification to poles during the second eight-year inspection cycle. As such, reliability of FPL's system should not be compromised and FPL projects annual savings of $528,000. Therefore, staff recommends FPL be granted authority to deviate from performing load assessments as required by Order No. PSC-06-0144-PAA-EI during the second eight-year pole inspection cycle with regards to any pole that had a load assessment of less than 80 percent of full load during the first eight-year cycle.

Issue 3: Should this docket be closed?

Recommendation: Yes. If no person whose substantial interests are affected by the proposed agency action files a protest within 21 days of the issuance of the order, this docket should be closed upon the issuance of a consummating order. (Young)

Staff Analysis: If no person whose substantial interests are affected by the proposed agency action files a protest within 21 days of the issuance of the order, this docket should be closed upon the issuance of a consummating order.