

State of Florida



## Public Service Commission

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

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**DATE:** March 23, 2006

**TO:** Director, Division of the Commission Clerk & Administrative Services (Bayó)

**FROM:** Division of Economic Regulation (Breman)  
Office of the General Counsel (Helton)

**RE:** Docket No. 060198-EI – Requirement for investor-owned electric utilities to file ongoing storm preparedness plans and implementation cost estimates.

**AGENDA:** 04/04/06 – Regular Agenda – Proposed Agency Action – Interested Persons May Participate

**COMMISSIONERS ASSIGNED:** All Commissioners

**PREHEARING OFFICER:** Administrative

**CRITICAL DATES:** None

**SPECIAL INSTRUCTIONS:** None

**FILE NAME AND LOCATION:** S:\PSC\ECR\WP\060198.RCM.DOC

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### Case Background

On January 23, 2006, Commission staff conducted a workshop to discuss damage to electric utility facilities resulting from recent hurricanes and to explore ways of minimizing future storm damages and customer outages. State and local government officials, independent technical experts, and Florida's electric utilities participated in the workshop. On January 30, 2006, some participants filed post-workshop comments.

At the February 27, 2006, Internal Affairs, staff briefed the Commission on recommended actions to address the effects of extreme weather events on electric infrastructure. The Commission also heard comments from government representatives, independent experts,

and Florida's electric utilities regarding staff's recommended actions. The Commission modified various aspects of staff's proposal. In brief, the Commission decided the following:

- 1) All Florida electric utilities, including municipal utilities and rural electric cooperative utilities, will provide a 2006 Hurricane Preparedness Briefing at the Internal Affairs on June 5, 2006.
- 2) Staff will file a proposed agency action recommendation for the April 4, 2006, Agenda requiring each investor-owned electric utility to file plans and estimated implementation costs for ongoing storm preparedness initiatives.
- 3) A docket will be opened to imitate rulemaking to adopt distribution construction standards that are more stringent than the minimum safety requirements of the National Electric Safety Code.
- 4) A docket will be opened to imitate rulemaking to identify areas and circumstances where distribution facilities should be required to be constructed underground.

The purpose of this recommendation is to recommend to the Commission the requirements for the plans and estimated implementation costs discussed above. The Commission has jurisdiction pursuant to Sections 366.04(2)(c), (2)(f), and (5), 366.05(7), Florida Statutes.

### **Discussion of Issues**

**Issue 1:** Should the Commission require each investor-owned electric utility to file plans and estimated implementation costs for ongoing storm preparedness initiatives?

**Recommendation:** Yes. On or before June 1, 2006, each investor-owned electric utility should, at a minimum, file plans and estimated implementation costs addressing each of the following initiatives:

- 1) A Three-year Vegetation Management Cycle for Distribution Circuits,
- 2) An Audit of Joint-Use Attachment Agreements,
- 3) A Six-year Transmission Structure Inspection Program,
- 4) Hardening of Existing Transmission Structures,
- 5) A Transmission and Distribution Geographic Information System,
- 6) Post-Storm Data Collection and Forensic Analysis,
- 7) Collection of Detailed Outage data Differentiating Between the Reliability Performance of Overhead and Underground Systems,
- 8) Increased Utility Coordination with Local Governments,
- 9) Collaborative Research on Effects of Hurricane Winds and Storm Surge, and
- 10) A Natural Disaster Preparedness and Recovery Program.

In the event that a utility proposes an alternative to one of the above initiatives, the utility should describe its proposed alternative and explain why the alternative is better in terms of cost and avoiding future storm damages. Within each plan, the utility should describe the scope of activities, implementation timeline, and estimated program costs for the next ten years. The utility should also highlight those activities and costs that are incremental to current activities and costs. A utility should provide an estimate of any incremental costs associated with the implementation of each of the above initiatives. Upon a specific showing of hardship, the Commission staff may allow a utility to file a plan after June 1, 2006. Each request for time extension should be filed with the Commission Clerk. (Breman, Helton)

**Staff Analysis:** Staff's recommendation relies on information collected through the staff workshop held on January 23, 2006, the post-Hurricane Wilma forensic review of Florida Power & Light Company's (FPL) facilities by KEMA, recent staff audits, and the discussions on Item 3 at the February 27, 2006 Internal Affairs. Ten initiatives were approved at the February 27<sup>th</sup> Internal Affairs conference:

- 1) A Three-year Vegetation Management Cycle for Distribution Circuits,
- 2) An Audit of Joint-Use Attachment Agreements,
- 3) A Six-year Transmission Structure Inspection Program,
- 4) Hardening of Existing Transmission Structures,
- 5) A Transmission and Distribution Geographic Information System,
- 6) Post-Storm Data Collection and Forensic Analysis,
- 7) Collection of Detailed Outage Data Differentiating Between the Reliability Performance of Overhead and Underground Systems,
- 8) Increased Utility Coordination with Local Governments,
- 9) Collaborative Research on Effects of Hurricane Winds and Storm Surge, and

10) A Natural Disaster Preparedness and Recovery Program.

At the February 27<sup>th</sup> Internal Affairs, the Commission directed staff to file a proposed agency action recommendation setting out the requirements of the implementation plans to be filed by each investor-owned electric utility. Staff has incorporated the Commission guidance provided at the Internal Affairs conference and subsequent discussions with interested persons in the following review of the ten identified initiatives.

(1) A Three-year Vegetation Management Cycle for Distribution Circuits.

Utilities typically have two different vegetation management plans, one for transmission facilities and another for distribution facilities. In general, transmission vegetation management activity is more rigorous than distribution vegetation management. Transmission structures tend to be taller than distribution structures. Distribution structures are typically at or below tree heights. Also, the amount of tree clearing a utility is able to achieve within a transmission corridor is greater than the utility's ability to clear trees within the proximity of its overhead distribution facilities. Thus, tree related storm damages are more likely to occur on overhead distribution facilities than on transmission facilities. Staff believes additional emphasis needs to be placed on maintaining tree clearances from overhead distribution facilities to reduce the potential for vegetation-related storm damage.

Utilities have various overhead distribution vegetation management programs. Progress Energy Florida, Inc. (PEF) and FPL use a 3-year trim cycle as a target for their respective programs. Florida Public Utilities Company (FPUC), in 2004, began a 2-year trim cycle in its Northeast Division (Fernandina) while a 5-year trim cycle was established for its Northwest Division (Marianna) in 2002. Tampa Electric Company (TECO) and Gulf Power Company (GULF) do not use a fixed trim-cycle. TECO and GULF use various metrics, such as number of outages and date of last trim, as tools to determine when and where tree clearing should occur.

However, the amount of tree clearing that occurs may not be consistent with utility vegetation management programs. A July 2005 staff audit of PEF vegetation management found that the miles trimmed had declined during a period when tree-caused outages had increased. During the same period, PEF's targeted three-year trim cycle was not being met. Staff's July 2005 audit of FPL's vegetation management program revealed similar patterns. In its post-workshop comments, FPL stated that it would ensure a three-year clearing cycle for all main lines (feeders). Staff notes that problem trees exist in the proximity of other circuits, not just the main lines. A June 2005 staff audit of TECO vegetation management showed an increasing pattern in vegetation-caused outages for the five years prior to 2005. Yet, TECO's 2005 vegetation management budget was lower than in prior years. FPUC has only recently migrated to a formal vegetation management program. A March 2005 staff audit of FPUC revealed that vegetation contractor activity was curtailed due to budget constraints in 2002.

The vegetation management practices of the investor-owned electric utilities does not provide adequate assurance that tree clearances for overhead distribution facilities are being maintained in a manner that is likely to reduce vegetation related storm damage. Staff believes that utilities should develop more stringent distribution vegetation management programs. The

plans implementing such a program should enumerate minimum performance requirements. Staff believes that a three-year trim cycle is a reasonable minimum requirement for tree clearing along major distribution circuits known as primary feeders. Trimming along other circuits should also be on a three-year cycle, unless it is cost prohibitive. Nevertheless, each investor-owned electric utility should provide a plan and estimated costs for a complete three-year trim cycle for all distribution circuits. Any additional alternatives proposed by the utility should be compared to a three-year trim cycle and must be shown to be equivalent or better in terms of cost and reliability for purposes of preparing for future storms.

### (2) An Audit of Joint-Use Attachment Agreements.

Utilities periodically review their facilities for joint-use attachments. Independent technical experts, at the January 23, 2006, staff workshop, presented information suggesting that a percentage of existing electric utility poles are overloaded and approaching overloading due to non-electric utility attachments to the poles. Utility poles that are overloaded or approaching overloading are subject to failure in extreme weather. While the data presented at the staff workshop was based on national data, the concerns regarding potential pole overloading and failure in extreme weather conditions was not rebutted by the Florida electric utilities. Thus, Florida's utilities have not provided adequate assurance that their joint-use facility agreements avoid storm damages and customer outages.

By Order No. PSC-06-0144-PAA-EI, issued February 27, 2006, in Docket No. 060078-EI, In Re: Proposal to Require Investor-Owned Electric Utilities to Implement a Ten-Year Wood Pole Inspection Program, the Commission required investor-owned electric utilities to establish an eight-year inspection cycle for wood pole strength including the effects of pole attachments. The order is silent regarding joint-use attachments to non-wood poles. The order is also silent regarding undetected pole attachments that may occur between wood pole strength inspections. Thus, the order does not address all ongoing reliability concerns associated with pole attachments for purposes of preparing for future storms.

Staff recommends that each investor-owned electric utility be required to develop a plan for auditing joint-use agreements that includes pole strength assessments. These audits should include both poles owned by the electric utility to which other utility attachments are made (i.e., telecommunications and cable) and poles not owned by the electric utility to which the electric utility has attached its electrical equipment. The location of each pole, the type and ownership of the facilities attached, and the age of the pole and the attachments to it should be identified. Utilities should verify that such attachments have been made pursuant to a current joint-use agreement. Stress calculations should be made to ensure that each joint-use pole is not overloaded or approaching overloading for instances not already addressed by Order No. PSC-06-0144-PAA-EI.

### (3) A Six-year Transmission Structure Inspection Program.

Transmission inspection practices vary widely among the investor-owned electric utilities. KEMA's post-Hurricane Wilma review of FPL's 500 KV transmission tower inspection practices states FPL practices a "4-year 10% sample inspection." Staff believes this

means that, every four years, FPL inspects 10 percent of the 500 KV transmission towers for loose bolts, cross-bracings, and damages to other appurtenances. KEMA concluded that FPL's inspections were not sufficient to discover loose or missing bolts on the transmission towers. Failures of various FPL transmission lines during Hurricane Wilma caused at least 94 percent of FPL's Hurricane Wilma substation outages. In a July 2005 staff audit of PEF's transmission pole inspection and maintenance programs, the auditor noted that PEF did not perform ground-line inspections on transmission poles from 1999 through 2004. Discussions subsequent to the January 23<sup>th</sup> staff workshop indicate that PEF currently targets a five-year inspection cycle for its transmission facilities. A June 2005 staff audit of TECO's transmission inspection program noted that TECO performed few, if any, pole inspections from 2000 through 2003. Gulf stated at the January 23<sup>rd</sup> staff workshop, that it inspects all transmission poles and structures on a 12 year cycle. Every six years GULF performs one of the following types of inspections of its transmission facilities: ground inspection, wood ground line treatment inspection, steel ground line treatment inspection, comprehensive walk inspection, and routine aerial patrol.

Based on this wide divergence of the frequency and scope of utility transmission inspection practices, staff is not convinced that current utility transmission facility inspections are adequate to prepare for future storms. By Order No. PSC-06-0144-PAA-EI, issued February 27, 2006, in Docket No. 060078-EI, In Re: Proposal to Require Investor-Owned Electric Utilities to Implement a Ten-Year Wood Pole Inspection Program, the Commission required investor-owned electric utilities to establish at least an eight-year inspection cycle that assesses the remaining strength of wood distribution and transmission poles. The order is silent regarding inspections on non-wood poles. The order is also silent regarding other transmission inspections that should be periodically completed on the various structures and appurtenances that comprise the transmission system such as insulators, guying, grounding, conductor splicing, cross-braces, cross-arms, bolts, etc. Additionally, Order No. PSC-06-0144-PAA-EI, is silent regarding the critical nature of transmission facilities and whether an eight year inspection cycle for all transmission facilities is adequate to prepare for future storms. Thus, Order No. PSC-06-0144-PAA-EI, does not address the full inspection of all transmission poles, towers, and other line supporting structures.

Staff recommends that each investor-owned electric utility be required to develop a plan for fully inspecting all transmission towers and other transmission line supporting equipment such as such as insulators, guying, grounding, conductor splicing, cross-braces, cross-arms, bolts, etc. Furthermore, staff believes that all substations, capacitor stations, relay stations, and switching stations should be included in the transmission inspection plan because of the critical nature of these facilities.

The transmission inspection plan should be based on achieving at least a six-year inspection cycle for the portions of the transmission infrastructure not already addressed by Order No. PSC-06-0144-PAA-EI. Staff bases the six-year criteria on GULF's efforts to achieve at least one detailed inspection within a six-year period and PEF's target of a 5-year transmission inspection cycle. Each investor-owned electric utility should propose a program methodology that is effective in assuring the utility is adequately prepared for future storms. All alternatives shall be compared to a six-year inspection cycle methodology and must be shown to be equivalent or better in terms of cost and reliability for purposes of preparing for future storms.

(4) Hardening of Existing Transmission Structures.

In 1993, after Hurricane Andrew, FPL stated it was reconsidering use of wooden transmission structures. At the January 23<sup>rd</sup> staff workshop, FPL stated it is replacing wooden structures on a maintenance basis and whenever relocations occur. In 2001, PEF decided to begin replacing all of its wooden transmission structures with either steel or concrete construction. However, the recent staff workshop and subsequent documents have not shown the extent of utility efforts in this area nor the criteria used to select which transmission structures are upgraded or replaced.

At the February 27<sup>th</sup> Internal Affairs Conference, Mr. Martin Rollins, representing interests of the wood pole industry, indicated that wood poles remain a viable industry option and may even decrease the time needed to restore electric service compared to concrete, steel, and other non-wood options.

Staff recommends that each investor-owned electric utility develop a plan to upgrade and replace existing transmission structures. The plan should include the scope of activity, any limiting factors, and the criteria used for selecting transmission structure upgrades and replacements.

(5) A Transmission and Distribution Geographic Information System.

During the January 23<sup>rd</sup> staff workshop it became apparent that utilities need to do a better job keeping track of the facilities in the field in order to demonstrate that facilities are prepared for future storms. KEMA, in its review of FPL's Hurricane Wilma performance, discusses efforts to use FPL's geographic information system. FPL's geographic information system was not used because of limited area coverage and accuracy concerns when the data was compared to property accounting records. GULF is implementing a transmission and distribution geographic information system. An objective of Gulf's information system is to maintain facility specific data such as location and performance data. GULF found the geographic information system improves its storm restoration process.

Staff recommends the investor-owned electric utilities develop a program that achieves the same objective as GULF's geographic information system. Utilities should have the flexibility to propose a methodology that is efficient and cost effective in assuring the utility collects sufficiently detailed data to conduct forensic reviews, assess the performance of underground systems relative to overhead systems, determine whether appropriate maintenance has been performed, and evaluate storm hardening options.

(6) Post-Storm Data Collection and Forensic Analysis.

Utilities capture and maintain varying degrees of inspection data, vintage data, and other performance related data pertaining to the electric infrastructure. Lack of readily available performance data makes it difficult to conduct forensic reviews, assess the performance of underground systems relative to overhead systems, determine whether appropriate maintenance has been performed, and evaluate storm hardening options.

After Hurricane Wilma, FPL established a forensic team that collected information on storm damaged facilities. FPL's forensic team then provided this data to KEMA, an independent engineering firm that was assessing FPL's Hurricane Wilma performance. KEMA relied heavily on FPL's forensic data. KEMA's review noted an apparent lack of inspection record retention. Some portions of KEMA's review relied on interviews with FPL staff rather than records because FPL did not have maintenance records and facility specific data. In its post-workshop comments, GULF stated it is initiating a detailed post storm data collection process to provide improved storm damage analysis. The post-storm facility performance data collection will be in addition to any existing data collection. Thus, GULF will become better able to perform storm damage assessments because of its use of geographic information system in conjunction with specific improvements in data collection.

Staff recommends that each of the investor-owned electric utilities develop a program that collects data for purposes of forensic analysis similar to GULF's program and FPL's post-Hurricane Wilma forensic team efforts. A utility may integrate this initiative with its graphic information system activities and also its post-storm data collection activities. Utilities should have the flexibility to propose a methodology which is efficient and cost effective in assuring the utility collects sufficiently detailed data to conduct forensic reviews and become better able to evaluate storm hardening options.

(7) Collection of Detailed Outage Data Differentiating Between the Reliability Performance of Overhead and Underground Systems.

Notwithstanding the general need to increase post-storm data collection, utilities should collect storm performance data that differentiates between overhead and underground systems. Data regarding overhead and underground system performance is needed to adequately inform customers and communities who are considering their options. The same data is needed by the utility to address storm hardening options that reduce storm damage, storm restoration costs, and customer outages.

Utilities should collect a sufficient level of detail to enable the utility to determine the percentage of storm caused outages that occur on overhead systems and on underground systems. Additionally, the utility should be able to assess the performance and failure mode of competing technologies that may be in the field such as direct bury cable versus cable-in-conduit and concrete poles versus wood poles. Location factors that contribute to overall performance, such as front-lot versus back-lot and pad-mounted versus vault, should be collected. Thus, the utility should become better able to assess the effects of high winds and storm surges reliability performance on overhead and underground systems on an ongoing basis.

Staff recommends that each investor-owned electric utility develop a program to collect performance data that differentiates between overhead and underground facility performance. A utility may integrate this initiative with its graphic information system activities and also with its post-storm data collection activities. Each utility should have the flexibility to propose whichever methodology is most efficient and cost effective in assuring the utility collects



sufficiently detailed data to conduct forensic reviews differentiating between overhead and underground facility performance.

(8) Increased Utility Coordination with Local Governments.

A key element in providing quality service is knowing the needs and desires of your customers. While utilities have various public outreach programs, the workshop highlighted the need for better communication between the utilities and the cities and counties they serve. While utilities work with local governments prior to and immediately after a storm, staff believes that each utility should actively work with local communities year-round to identify and address issues of common concern.

This point was raised by Mayor Anne Castro of the City of Dania Beach who suggested that a more integrated partnership between local governments and the utility could assist the utility in better serving its customers. Mayor Castro explained:

“We want to be the eyes and ears for FPL. We have offered ...[to]..train our public service people, our public safety people, especially after a hurricane or even on an ongoing basis during the year, as to what to look for in their infrastructure. If they could teach us what to look for as far as poles being bad or wires being bad or fuses hanging or loose ends hanging, our folks, as they routinely do this through code enforcement, through the fire department, through the police department, are happy to go out there and take a look. Even our citizens on patrol...turn in half of the code violations anyway...they can report all that, they can create a list...”

The comments of Mayor Castro demonstrate the precise type of cooperative spirit that can help utilities target their resources to meet local needs and priorities.

There is already precedent for this level of cooperation with local governments. The Department of Community Affairs has developed a statewide local mitigation strategy which provides guidance to local governments. Several of the proposals listed in the mitigation guidelines are easily adaptable and equally applicable to utility/government relationships. For example, the guidelines require local governments to provide a multi-hazard map of the community. This would identify flood zones and areas prone to wind damage, consistent with the discussions by Dr. Domijan, University of South Florida, and Dr. Gurley, University of Florida.

The mitigation guidelines also cite the need for land use patterns and discussion on development trends provided by the Future Land Use and Coastal elements of the local comprehensive plans. The section on mitigation techniques notes the importance of identifying areas subject to repetitive damage from disasters. It cites the need to develop plans to protect critical functions and structures. In other words, electric utilities need to develop plans to provide service to critical functions and structures. All of these functions are best performed in conjunction with the local governments most familiar with local needs and tolerances. This type of information can only assist the utility in designing and operating its system in the most cost

efficient manner. An example of improved dialogue with local communities is FPL's decision to use public right-of-way in its placement of underground facilities.

Staff recommends that each investor-owned electric utility develop a program to increase coordination with local governments. The intent of expanding any existing utility/government liaison program is to promote on-going dialogue on key issues with the goal of reaching some accommodation or agreement on how the utility and the governmental agency will work together to address mutual concerns and prioritize needs, considering the time and financial constraints associated with given actions. This would include discussing local issues such as undergrounding and tree trimming matters.

#### (9) Collaborative Research on Effects of Hurricane Winds and Storm Surge.

During the January 23<sup>rd</sup> staff workshop, the utilities appeared to be unaware of work being done by universities to study the effects of hurricane winds and storm surge within Florida. Each utility appeared engaged in independent efforts to gather its own data with little, if any, coordination of resources and information.

Staff believes Florida would be better served by consolidating utility resources through a centrally coordinated research and development effort with universities as well as research organizations. The purpose of such effort would be to further the development of storm resilient electric utility infrastructure and technologies that reduce storm restoration costs and outages to customers.

For the program to be effective, utilities must participate in funding. Each investor-owned electric utility should establish a plan that increases collaborative research, establishes continuing collaboration, identifies objectives, promotes cost sharing, and funds necessary work. The investor-owned electric utilities should solicit participation from the municipal electric utilities and rural electric cooperative utilities in addition to available educational and research organizations.

#### (10) A Natural Disaster Preparedness and Recovery Program.

A key element in minimizing storm-caused outages is having a natural disaster preparedness and recovery plan. A formalized disaster plan provides an effective means to document lessons learned, improve disaster recovery training, pre-storm staging activities, and post-storm recovery. Each investor-owned electric utility should be required to develop, if it has not already, a formalized disaster preparedness and recovery plan that outlines its respective disaster recovery procedures. Each utility should maintain a current copy of its utility disaster plan with the Commission on a going-forward basis.

#### Additional Initiatives and Alternative Plans.

The above ten initiatives are not intended to encompass all reasonable ongoing storm preparedness initiatives. The Commission, at the February 27, 2006, Internal Affairs conference, indicated that action regarding the ten specifically identified initiatives is a starting point of an

ongoing process. Utilities and interested parties are encouraged to identify additional initiatives and to suggest alternative plans so long as the same goals are achieved in a cost effective manner.

Utility Plans and Implementation Costs.

The recommended initiatives will impact each utility differently. Utility specific information such as the timeline for implementing the initiative, program methodology, costs, and rate impacts, are substantially unknown. Each utility is expected to evaluate existing programs, expansion of existing programs, and if necessary, develop entirely new programs to address the ten above initiatives. Thus, it is necessary for each utility to develop plans for implementing each of the above initiatives.

Within each plan, the utility should describe the scope of activities, implementation timeline, and estimated annual program costs for the next ten years. Various activities and costs are expected to be incremental to those included in current base rates. The utility should highlight all incremental activities and costs included in its plan. In the event that a utility proposes an alternative to one of the ten above initiatives, the utility should describe its proposed alternative and explain why the alternative is equivalent or better in terms of cost and avoiding future storm damages. The plans should be filed with the Commission Clerk in this docket, on or before June 1, 2006.

**Issue 2:** Should this docket be closed?

**Recommendation:** No. This docket should be held open for the filing of utility plans and review and approval of the utility plans. 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, the proposed agency action order should become final. (Helton)

**Staff Analysis:** The utilities will be filing plans and estimated costs for the ten specifically identified initiatives. Utilities have the flexibility to pursue alternatives and initiatives not specifically discussed in this recommendation. This docket should be held open to address the filing of utility plans. Staff plans on bringing a recommendation addressing the adequacy of the utility plans to a future Agenda Conference. At the conclusion of the 21 day protest period, if no protest is filed the proposed agency action order should become final.