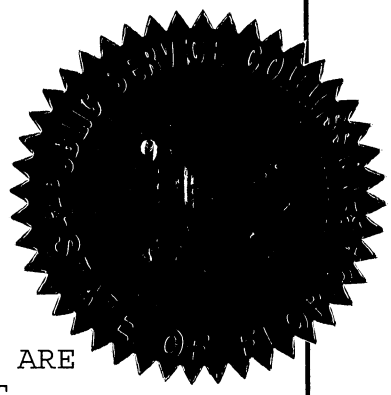
BEFORE THE
FLORIDA PUBLIC SERVICE COMMISSION

In the Matter of:

REVIEW OF 2007 ELECTRIC INFRASTRUCTURE STORM HARDENING PLAN FILED PURSUANT TO RULE 25-6.0342, F.A.C., SUBMITTED BY TAMPA ELECTRIC COMPANY.	DOCKET NO. 070297-EI
REVIEW OF 2007 ELECTRIC INFRASTRUCTURE STORM HARDENING PLAN FILED PURSUANT TO RULE 25-6.0342, F.A.C., SUBMITTED BY PROGRESS ENERGY FLORIDA, INC.	DOCKET NO. 070298-EI
REVIEW OF 2007 ELECTRIC INFRASTRUCTURE STORM HARDENING PLAN FILED PURSUANT TO RULE 25-6.0342, F.A.C., SUBMITTED BY GULF POWER COMPANY.	DOCKET NO. 070299-EI
REVIEW OF 2007 ELECTRIC INFRASTRUCTURE STORM HARDENING PLAN FILED PURSUANT TO RULE 25-6.0342, F.A.C., SUBMITTED BY FLORIDA POWER & LIGHT COMPANY.	DOCKET NO. 070301-EI

_____/



ELECTRONIC VERSIONS OF THIS TRANSCRIPT ARE
A CONVENIENCE COPY ONLY AND ARE NOT
THE OFFICIAL TRANSCRIPT OF THE HEARING,
THE .PDF VERSION INCLUDES PREFILED TESTIMONY.

VOLUME 3

Pages 307 through 489

PROCEEDINGS: HEARING

BEFORE:	CHAIRMAN LISA POLAK EDGAR COMMISSIONER MATTHEW M. CARTER, II COMMISSIONER KATRINA J. McMURRIAN COMMISSIONER NANCY ARGENZIANO COMMISSIONER NATHAN A. SKOP
DATE:	Wednesday, October 3, 2007
TIME:	Commenced at 9:48 a.m.
PLACE:	Betty Easley Conference Center Room 148 4075 Esplanade Way Tallahassee, Florida
REPORTED BY:	LINDA BOLES, RPR, CRR Official FPSC Reporter (850) 413-6734
APPEARANCES:	(As heretofore noted.)

I N D E X

WITNESSES

EXHIBITS

NUMBER:		ID.	ADMTD.
34	PJR-1	455	460
35	PJR-2	455	460
36	PJR-3	455	460
37	RLW-1	474	486

P R O C E E D I N G S

(Transcript continues in sequence from Volume 2.)

CHAIRMAN EDGAR: Good morning. Call the hearing to order this morning. Thank you all. Thank you to Commissioner Carter for standing in for me yesterday. And Commissioner Argenziano is not able to join us this morning. She may be joining us later today.

And I understand that we may have some preliminary matters to address before we go back to testimony from the current witness.

MR. WILLIS: That's correct. Madam Chairman, we would request that we suspend the cross-examination of Tampa Electric at this juncture and move to other cross-examination of this witness in hopes that we will be able to avoid further cross-examination altogether as we, we're continuing to try to reach an agreement. So that would be helpful, if that's okay with you.

CHAIRMAN EDGAR: Okay. So my understanding is that the request from TECO is that we stop the questioning from TECO to FCTA Witness Harrelson at this point in time, with the understanding that you may want to have the opportunity to resume cross, but we'll see how that goes?

MR. WILLIS: Correct.

CHAIRMAN EDGAR: Okay. Are there, are there questions on cross in this docket from any of the other

parties? I'm seeing no, no. And no questions from staff?

MS. FLEMING: No questions.

CHAIRMAN EDGAR: Commissioners, any questions for this witness on this docket? And I'm seeing none.

Then, Mr. Willis, that sounds like a reasonable request to me.

Ms. Fleming.

MS. FLEMING: There are a couple of other preliminary matters that we need to address. It is not clear in the transcript whether Battaglia's direct testimony was moved into the record yesterday, so I would defer to Mr. Badders to address that.

CHAIRMAN EDGAR: Mr. Badders.

MR. BADDERS: Thank you. I apologize. It appears I may not have moved his testimony in. So at this time I would like to move the direct testimony of Ed Battaglia into the record as though read.

CHAIRMAN EDGAR: Okay. The direct prefiled testimony of Witness Battaglia will be entered into the record as though read.

(REPORTER'S NOTE: For convenience of the record, Witness Battaglia's prefiled direct testimony was entered into the record in Volume 1, Page 85.)

MR. BADDERS: Thank you.

CHAIRMAN EDGAR: Thank you.

Ms. Fleming.

MS. FLEMING: On another matter as far as Witness Harrelson regarding the Progress docket, as you know, the Progress docket was stipulated yesterday and the issues were approved by the Commission. So staff would suggest that Witness Harrelson's testimony with respect to the Progress docket be stipulated if there are no objections and no Commissioners have any questions.

CHAIRMAN EDGAR: Okay. Commissioners, any questions for Witness Harrelson in the Progress docket?

COMMISSIONER CARTER: No, ma'am.

CHAIRMAN EDGAR: Seeing none. Ms. Fleming, no questions.

MS. FLEMING: Okay. Then when we get to that point, I guess it would be right after we start, we can move in Witness Harrelson's prefiled testimony in the Progress docket and then proceed to his testimony in the FPL docket.

CHAIRMAN EDGAR: Okay. Are there questions on cross for Witness Harrelson in the Progress docket from any of the other parties? And I'm also seeing no, seeing none. So --

MR. SEIVER: Thank you, Madam Chair. At this point we would then switch to the Progress docket, if we could. And I would like to move into the record based on the stipulations the prefiled direct testimony of Mr. Harrelson in the Progress docket, which is 070298-EI.

CHAIRMAN EDGAR: Okay. The prefiled testimony of Witness Harrelson will be moved into the record for the Progress docket as though read.

Introductory Issues

Q. Please state your name, title, and business address.

A. My name is Michael T. Harrelson. I am a registered professional engineer (Electrical), and an engineering consultant.

Q. On whose behalf are you filing this testimony?

A. I am appearing on behalf of the Florida Cable Telecommunications Association, Inc. ("FCTA"), an intervener in this proceeding.

Q. Would you please summarize your education, experience and qualifications?

A. Certainly. I have Bachelor of Science in Industrial Engineering from Georgia Tech where I was a co-op student while working for Georgia Power Company. I started working at Georgia Power in electric distribution in their co-op program where I also began work toward my B.S. when I was 18, in 1963. I was at Georgia Power in various districts and in various capacities of electric distribution, engineering, construction and maintenance until 1992. In 1992, I began a career as an Engineering Consultant. I am a registered professional engineer in Georgia and Florida. A more detailed rendering of my work history is included in my CV which is attached as Harrelson Exhibit 1 ("MTH-1").

Q. Have you had any experience in working with joint use of electric distribution poles by communications companies?

A. Yes. I have had extensive experience in this area.

Q. Do you have knowledge of the National Electrical Safety Code ("NESC")?

A. Yes I do. The NESC is the national safety standard for electric supply stations and electric supply and communication lines. The current edition is ANSI C2-2007, ISBN No. 0-7381-4893-8. The purpose of the NESC is the practical safeguarding of persons during the installation, operation, or maintenance of electric supply and communication

lines and associated equipment. This code is not intended as a design specification or as a construction manual. The NESC rules contain the basic provisions that are considered necessary for the safety of employees and the public under the specified conditions. If the responsible party wishes to exceed these rules, he may do so for his own purposes, but need not do so for safety purposes. NESC compliance is mandatory in Florida for electric power and communications companies.

Q. Do you consider yourself knowledgeable in these areas?

A. Yes. I consider myself to be an expert in the NESC and its application to construction, installation, maintenance, inspection, and audit of electric and communications facilities on poles.

Q. Why is that?

A. I worked for Georgia Power Company for a total of 27 years, including during the late 1960s and early 1970s when the first cable television systems were built in Georgia, and elsewhere around the country. Because I worked for Georgia Power until 1992, I also witnessed the upgrade and rebuild of improved generations of cable television systems and saw how both cable companies and pole owners, including power companies, work together to complete these system upgrades and rebuilds. Since retiring from Georgia Power I have worked as a consulting engineer and an expert witness to electric companies, cable companies and others.

Q. Have you ever been qualified as an expert witness?

A. Yes.

Q. In what subjects or fields have you been so qualified?

A. I have been qualified as an expert in (1) the NESC requirements; (2) electric power distribution design, construction, engineering, operation, and maintenance procedures; (3) joint use of utility poles by power and communications companies; (4) OSHA electric

power and communications safety regulation; and (5) the National Electric Code, which applies to electric power utilization systems.

Q. On how many occasions have you given testimony as an expert witness in these areas?

A. I have testified either in deposition or at trial approximately 41 times in the past 18 years. I testified in a pole attachment dispute before the Utah Public Service Commission in a matter closely related to some issues in this proceeding. That dispute involved attachment permitting procedures, engineering guidelines for attachments, and interpretations of the NESC. In addition, in a similar dispute in Arkansas, I submitted written testimony to the FCC and participated in a mediation session before the Federal Communications Commission ("FCC"). I have also submitted written comments to the Louisiana Public Service Commission in a proceeding to reconsider regulations regarding pole attachment procedures in the state. Moreover, in the spring of last year I gave deposition testimony, submitted direct testimony and testified live on cross examination before the Chief Administrative Law Judge ("ALJ") at the FCC on behalf of the FCTA and four of its member operators. The issue in that proceeding was whether Gulf Power was entitled to charge pole attachment rates in excess of rates produced using the FCC formula for cable operator attachments based on, among other things, Gulf Power's claim that its poles were "full" and that no capacity for further attachments existed. I testified that safe and customary engineering practices, based on my years of experience and the NESC, demonstrated that Gulf Power's poles had capacity and the Chief ALJ agreed with my analysis. The matter is now on appeal. I also participated in the Florida Commission's ("FPSC" or the "Commission") rulemaking proceeding in Dockets No. 060172-EU and 060173-EU, through which Rule 25-6.0342, Florida Administrative Code ("F.A.C."), was developed. Furthermore, I submitted Comments to this Commission in the Storm Preparedness proceeding, Docket No. 060198-EI.

Q. Do you have additional relevant experience?

A. Yes. I have participated in more than 100 pieces of litigation or accident investigations as a consultant.

Q. Are there other aspects of your training and background that may be relevant to your testimony?

A. Yes. In addition to working in this industry for quite a number of years, I regularly attend conferences on joint use, conduct training sessions and conduct pole-line inspections for pole owners like electric utilities, not unlike the inspections that are at least in part at issue in this proceeding. Through these activities I am very familiar not only with standard industry practices as they relate to outside aerial utility plant and joint use, but am also very familiar with the trends and "state-of-the-art" of utility and communications company practices in this area.

Q. Do you have experience with hurricanes in South Florida?

A. Yes. I worked in South Florida for an electric cooperative in restoration of service after Hurricanes Jean, Francis, Charlie and Wilma. I personally observed the destruction of trees and buildings and their impact on distribution lines, as well as the poles leaning in softened soil, and cascading failures caused by one pole being broken that resulted in several more poles being broken. I saw places where several poles broke and fell in one direction but several adjacent poles in the same line fell in the opposite direction indicating tornado type winds in localized areas. The greatest numbers of power outages were caused by tree limbs and broken wires, not broken poles.

Q. Has your work been limited to field work?

A. No. I have consulted as a Registered Professional Engineer in joint use contract interpretation and application for 15 years. This includes inspecting joint use facilities, training field engineers and line workers in the NESC, joint use contracts and safe-work

rules, negotiating specific separation, clearance and arrangement requirements (which are additional requirements sometimes imposed by power companies). I have also negotiated procedures, techniques and schedules to complete safety audits, make-ready engineering, make-ready construction and post inspection for joint use projects. I have prepared and conducted numerous workshops or seminars for national joint use conferences and personally conducted several NESC code compliance audits, as well as prepared the necessary make-ready engineering for the power companies and communications companies involved that was necessary to correct violations uncovered in those audits.

Q. Anything else?

A. Yes. In the past I have been President of local utility coordinating committees in Brunswick and Milledgeville, Georgia and periodically attend national joint use conferences.

Q. Please describe your work as President of the local utility coordinating committees.

A. These are organizations that are established to foster better communication among the different industries and users that need to use poles and be in the right-of-way. We discuss, design and implement ways to accommodate safe, practical and timely access and use of the limited facilities that all these different companies need to use to provide their services.

Q. Is the purpose of these committees to facilitate joint use of poles?

A. Yes, in part. Other issues such as joint trenching, right-of-way restoration, tree-trimming and the like were also considered. But the principal motive for these particular organizations and ones like them is to provide a forum for inter-industry understanding and to find real-world solutions to real-world problems in the joint use area.

Q. Are you sponsoring exhibits in this case?

A. Yes. MTH-1 (my curriculum vitae and list of testimonies); MTH-2 (Affidavit of Dr. Lawrence M. Slavin Supporting Initial Comments of Verizon Florida Inc. Concerning Proposed Amendments to Rules 25-6.034, 25-6.064, 25-6.078, and 25-6.115, Dockets 060173-EU and 060172-EU (FPSC, filed Aug. 11, 2006) ("Slavin Affidavit")); and MTH-3 (Process to Engage Third Party Attachers).

Q. Could you please explain what your assignment from FCTA was in this proceeding?

A. Certainly. My assignment was to evaluate the Storm Hardening Plan (the "Plan") filed by Progress Energy Florida, Inc. ("PEF", "Progress" or the "Company") in this docket for the purpose of determining whether the Plan meets the overall objective of the Commission, as set forth in Rule 25-6.0342, F.A.C., of enhancing the reliability of electric transmission and distribution service in a prudent, practical and cost-effective manner. In my testimony, I will address the Company's decision to adhere to Grade C construction for its distribution facilities while adopting extreme wind loading standards for transmission facility projects, the deployment strategy the Company will follow to implement those standards, and whether the adopted standards and deployment strategy meet the Commission's overall objectives. I will also address the extent to which the standards and procedures for third party attachments included in the Plan meet or exceed the NESC to assure as far as reasonably practicable that third party attachments do not impair electric service reliability or overload the pole, and are constructed, maintained and operated in accordance with generally accepted engineering practices for the IOU's service territory. Lastly, I will address the extent to which the Company sought and attempted in good faith to accommodate input from attaching entities.

Q. How do the provisions of the Company's Plan impact the cable operators who are attached to the Company's poles?

A. Cable operators rely on telephone and increasingly power company (who own collectively approximately 80% of the poles statewide) pole infrastructure to distribute video, voice and broadband services to over five million residents throughout the state of Florida. Cable operators are in an intensely competitive industry (competing with satellite operators and telephone companies) and have a fervent interest in ensuring that poles stay up—and their facilities too—to minimize service interruptions, provide access to the Internet, phone service, cable service and important emergency and information services. FCTA and its members also are interested in ensuring that the State's utility poles are safe and reliable and that construction, maintenance and inspection costs are reasonable. Because of quality of service objectives and competitive pressures, cable operators must be sure there are no unreasonable delays in attaching or overlashing cables that would delay provisioning of service to customers, or unreasonable costs imposed that would jeopardize their ability to invest in new and innovative services. Cable operators pay rent based upon the fully allocated cost of the pole space occupied by the cable operator's attachment. Cable operators also directly reimburse utilities for the cost of making the pole ready for their attachments, and pay to make the pole compliant with the NESC when a cable operator is responsible for bringing the pole out of compliance. One of my most significant concerns is that cable operators could face additional delays in provisioning important services to their customers that are not related to pole safety and reliability due to the Company's Plan, as well as increased costs. I will address these and related issues below in reference to the Company's Plan and the relevant statutory and regulatory requirements.

Q. What is your understanding of what the Company's Plan must do to comply with Rule 25-6.0342, F.A.C.?

A. It is my understanding that under that provision the Company's Plan must meet the overall objective of enhancing the reliability of electric transmission and distribution service and reducing restoration costs and outage times in a prudent, practical, and cost-effective manner to the affected parties.

Q. Could you please give us details on what the Plan must include and do to meet those requirements?

A. Yes. First, the Plan must address the extent to which the Company complies with the NESC. Second, the Plan must address the extent to which it employs the extreme wind loading ("EWL") standards specified by Figure 250-2(d) of the 2007 edition of the NESC for new construction, major planned work, and critical infrastructure projects to achieve the objective of enhancing reliability and reducing restoration costs in a prudent, practical and cost effective manner. Third, the Plan must include a detailed description of its deployment strategy, including the facilities affected, the technical design specifications, construction standards, and construction methodologies employed, the communities and areas affected, the extent to which joint use facilities are affected, an estimate of the costs and benefits of the Plan generally, and an estimate of the costs and benefits of the Plan for third party attachers, and explain how the deployment strategy meets the desired objectives of enhancing reliability and reducing storm restoration costs and outage times in a prudent, practical and cost effective manner. Fourth, the Plan must demonstrate that the Company maintains standards and procedures for third party attachments that meet or exceed the NESC so as to assure as far as reasonably practicable that third party attachments do not impair electric service reliability or overload the pole, and are constructed, maintained and operated in accordance with generally accepted engineering practices for the investor-owned utility's (IOU) service territory, and do not conflict with Title 47, United States Code, Section 224, relating to FCC jurisdiction over pole

attachments. Lastly, the Company must show that, in developing its Plan, it sought input from, and attempted in good faith to accommodate concerns raised by, third party attachers such as cable operators.

Company Plan

Q. Have you read the Storm Hardening Plan and the Plan Supplement filed by the Company in the referenced docket?

A. Yes.

Q. Have you reviewed the Direct Testimony and Exhibits of the Company's witnesses, Jason Cutliffe and Mickey Gunter, dated August 24, 2007, filed in support of the Company's Plan?

A. Yes.

Q. Have you reviewed the answers to interrogatories and responses to document requests filed by the Company to date in this proceeding?

A. Yes.

Q. Should the Commission find that the Company's Plan meets the desired objectives of enhancing the reliability of overhead and underground electrical transmission and distribution facilities and reducing restoration costs and outage times in a prudent, practical and cost effective manner?

A. No.

Q. Why not?

A. First, the Company has not provided the level of detail for its deployment strategy required by Rule 25-6.0342(4), F.A.C. For example, with regard to projects identified for implementation in 2008 and 2009, the Plan lacks the level of detail necessary to enable the cable operators to determine the costs that they will incur as a result of those projects. However, the Process to Engage Third Party Attachers (MTH-3) that has been agreed to

by Progress sets forth a mutually satisfactory process for continuing the dialogue between utilities and third party attachers, including reasonable advance notice to, and a process for incorporating feedback from, third party attachers. This goes a long way toward alleviating my concerns about the level of required detail that currently is missing from Progress's Plan.

Furthermore, the Company's attachment standards and procedures should not be in the Plan for purposes of Commission approval. At a minimum, certain of the Attachment Standards and Procedures set forth in the Plan do not relate to storm hardening but instead concern rates, terms and conditions that are regulated by the FCC, and others are not *reasonably practicable* as required by Rule 25-6.0342(5), F.A.C. In addition, the Company has not fully satisfied its obligation to seek and attempt in good faith to accommodate concerns of third party attachers such as FCTA members.

Wind Loading Standard

Q. Does the Company's Plan address the extent to which, at a minimum, the Plan complies with the NESC, ANSI C2-2007, as required by Rule 25-6.0345, F.A.C.?

A. Yes. The Company's Plan addresses the extent to which it complies with the NESC to the extent required by Rule 25-6.0342, F.A.C. This Rule concerns strengthening poles to withstand extreme wind conditions. The relevant NESC rules are those that address loading and the effect of wind on the poles they are located in Sections 24 (Grades of Construction), 25 (Loadings for Grades B and C) and 26 (Strength Requirements). It is my understanding that other provisions of the NESC, including those related to clearances between electric and communications facilities, are not at issue in this proceeding. PEF does not address those requirements, but refers to them, and therefore, I am not expressing an opinion on those provisions except to point out which ones fall outside the scope of this proceeding and therefore should not be approved. With this understanding, yes, the

Company's Plan addresses the extent to which it complies with the NESC to the extent required by 25-6.0342(3)(a), F.A.C. *See, e.g.,* Plan at 4, and Progress Energy Florida's Responses to Staff's First Set of Interrogatories No. 2.

Q. Does the Company's Plan comply, at a minimum, with the NESC?

A. Yes. The NESC specifies required pole line strengths for distribution lines using grades of construction including Grades B, C and N. The required grade of construction depends upon the voltage of the circuits carried on the pole and what the circuits cross over. The NESC generally requires Grade C construction for "distribution" facilities less than 60 feet high. Grade B is required for certain crossings, including railroad tracks, limited-access highways, and navigable waterways requiring waterway crossing permits. In its Plan and Testimony, Progress indicates that it intends to maintain Grade C standard construction on a system wide basis, but will also conduct pilot projects for the purpose of testing Grade B and EWL construction under different field conditions as well as the Grade C standard. The Company's Plan appropriately applies Grade C construction in a manner consistent with the requirements of the NESC. Furthermore, Progress has already instituted a vegetation management program that will provide additional benefit to the storm hardening and restoration effort. As such, Progress's approach is not only consistent with the NESC, but represents a prudent, practical, and cost-effective approach.

Q. Does the Company's Plan address the extent to which it is adopting the extreme wind loading (EWL) standards specified by Figure 250-2(d) of the 2007 edition of the NESC?

A. Yes. Progress's plan explains at pages 9-15 the extent to which it adopts EWL standards for distribution facilities. It utilizes DCI's Asset Investment Strategy modeling to evaluate, select and implement storm hardening alternatives. PEF plans to conduct one EWL distribution pilot project on Feeder #X220 in St. Petersburg. The Company will also use

wind measuring devices and other data collection devices to study the performance of the various grades of construction. The Plan also calls for the conversion of 19 specific Interstate and major thoroughfare crossings from overhead lines to underground. In my opinion, these also qualify as EWL projects because they assure that the lines crossing these important highways will not fall into the road. My recommendation is that these highway crossings also be evaluated for the feasibility of applying storm guying to EWL standards as FPL and GULF plan to do with such crossings.

Q. Is the Company's Plan to adopt NESC EWL criteria only for Interstate and major thoroughfare crossings and one distribution pilot project, a prudent, practical and cost effective way to meet the Commission's objectives of ensuring electrical system reliability and reducing storm restoration cost and outages?

A. Yes. First, I agree with Progress's overall conclusion that EWL is not the right construction criteria to apply throughout its service territory. Second, I agree that it is prudent, practical and cost effective to pilot EWL criteria on a feeder in Pinellas Co, and to also test the performance of EWL construction using wind measuring devices. *See* PEF's Resp. to Staff Interrog. No. 4; Progress August 7, 2007, Plan Supplement.

Q. Please explain why you believe that EWL is not the right construction criteria to apply throughout Progress's service territory.

A. Progress's Plan to maintain its current standard of Grade C as a system-wide application is prudent, practical and cost effective. Grade C construction, when properly maintained, meets the NESC requirements for distribution facilities, while still ensuring a reliable, storm-hardy system. As noted by Jason Cutliffe, on behalf of Progress Energy, "the EWL standard would have no appreciable benefit for PEF's distribution poles with respect to preventing wind-caused damage" and "other coastal utilities and utilities that experience tornados, support the fact that the EWL standard has no appreciable wind damage

prevention benefit for their distribution poles." Cutliffe Test. at 6. Furthermore, as emphasized at Page 2 of its Plan Supplement, in many areas, the Company's distribution system includes span lengths that are shorter than required for Grade C construction because the facilities are located in urban areas. As such, in many locations, Progress's facilities already have design strengths much greater than 60 mph, and in many instances, even exceed Grade B. (PEF Plan Supplement, JC-2T, at 18) Progress is taking a measured approach to storm hardening, which focuses on practical efforts, such as vegetation management, as the means to prepare for severe storms, and it plans to study whether there may be benefits to Grade B or EWL construction through experimental projects.

The eight small conductor replacement projects which Progress has included in its plan is one of the most fundamental, economical, effective storm hardening initiatives available. When the replacement of these small high voltage wires which are prone to break and fall when hit by limbs in hurricanes or thunder storms is combined with a tree trimming and major maintenance overhaul of aging feeder lines it makes substantial improvements in reliability in all storms. These are exactly the type of "return to basics programs" that should be emphasized along with the solid commitment to bring Florida's tree trimming and wood pole inspections up to national standards. The eight year cycle is the National Rural Electrical Cooperatives standard for wood pole inspections for Florida. The three year cycle is the national recommended tree trimming cycle for distribution lines. The NESC Grade C in the basic national standard for distribution lines.

Progress's approach should result in minimal incremental costs while still ensuring improvement in storm performance and storm restoration. Progress estimates that it will spend up to $91 million in connection with hardening efforts in 2007, $98.7 million in 2008, and an additional $99.3 million in 2009, but these costs are targeted towards areas

most likely to provide the most significant storm hardening benefits, i.e. vegetation management, transmission upgrades, and targeted hardening projects along with increased maintenance such as was explained above.

Furthermore, Rule 250C of the 2007 NESC contains the EWL standard and describes the application of the extreme wind loading required in Rule 250A1 on poles and their supported facilities, including wires, transformers, etc. for purposes of determining the required strength of the pole. The current edition of the NESC exempts from the EWL criteria any structure and its supported facilities that are 60 feet or less above ground. As a clarifying point, only Rule 250C specifies when extreme wind loading is required, not Figure 250-2(d), which is the NESC provision referenced in F.A.C. 25-6.0342. Figure 250-2(d) specifies three-second gust wind speeds for Florida, which are then referenced in Rule 250C.

Q. Does the NESC require EWL for poles 60 feet or less in height?

A. No. The question of requiring EWL standards to be applied to all poles also has been carefully considered by the responsible NESC subcommittee. The NESC committee responsible for strengths and loadings of overhead electrical systems has considered on numerous occasions whether to apply EWL criteria to distribution lines less than 60 feet high. In fact, during each of the last two code cycles, the NESC committee considered proposed changes that would have required application of EWL to distribution systems of any height. In comments filed in those proceedings, the utility industry resoundingly agreed that most distribution pole failures in extreme weather events are the result of secondary damage effects from trees and debris, not wind alone, and that the system would have failed even if designed to the significantly more expensive EWL criteria. Based largely on this feedback from the field, the NESC committee retained the EWL exemption for structures 60 feet and less in the 2007 Code.

Q. Have other Florida utilities decided to adopt EWL criteria as part of their storm hardening plans?

A. Only FPL has embraced EWL as a standard of construction. Tampa Electric Company and Gulf Power Company are taking a similar approach to Progress; they are studying EWL criteria on a limited pilot project basis.

Indeed, other expert witnesses filing testimony on behalf of Gulf Power and Progress Energy Florida in support of their storm hardening plans agree that EWL is not the right standard for poles 60 feet and less in height. For example, according to Gulf Power's witness, Edward J. Battaglia, Gulf decided not to adopt the NESC EWL standards for all of its existing overhead distribution facilities because it is not cost effective to do so and stating, "Gulf's experience is that wind-blown debris is the predominant cause of damage versus pure wind." Battaglia Test. at 15. And, Mr. Mickey Gunter, who serves as a member of NESC Subcommittee 4 (Overhead Lines-Clearances,) Subcommittee 7 (Underground lines) and the Interpretations committee, filing testimony on behalf of PEF, stated, "I agree with the 217 others who supported the rejection of eliminating the 60 foot exemption and retaining it in the 2007 NESC edition because eliminating the 60 foot exemption would yield unnecessary costs without significantly improving or increasing safety." Gunter Test. at 7.

Similarly, Dr. Larry Slavin, Chairman of the NESC Subcommittee 5, which is responsible for provisions related to overhead-lines strength and loading, filed testimony on behalf of Verizon in Dockets 060173-EU and 060172-EU in which he opined that the application of EWL to distribution poles is not prudent or cost effective. Slavin Aff. § 3.1. I have attached that testimony as MTH-2. Dr. Slavin also pointed out that the use of EWL criteria may have negative unintended consequences including increasing vehicular injuries and deaths resulting from cars hitting a greater number of heavier poles, more

downed poles in storms, increased storm restoration delay resulting from more pole failures and harder to replace poles, and a steep learning-curve for engineers not yet trained in these types of complex engineering applications. *Id.* § 4.2. Dr. Slavin and I are also of like mind that EWL should be applied to distribution poles, if at all, on a limited "trial" or pilot project basis.

Q. Will building to EWL ensure that poles do not fail in hurricane conditions?

A. No. Based on my experience, the common causes of hurricane related pole failures are falling trees, flying tree limbs and building debris, soft soil made worse by heavy rains, weak guy failure, rotten pole failure, and finally wind force on poles, lines and attachments. Another common cause of wood pole failures is cascading of solid (strong) poles because an adjacent pole breaks in high wind because of flying debris, rot or another defect. These causes will not be remedied by application of EWL criteria. Structures designed to EWL are also prone to cascading failures.

Q. Did the Plan adequately consider using EWL for new construction, major planned work, expansions, rebuilds and relocations of the overhead distribution system?

A. Yes, the Plan considered and rejected applying EWL criteria to new construction, major planned work, expansion, rebuilds and relocations of the overhead distribution system. Instead, Progress states that it will continue to use Grade C criteria in these instances. Specifically, the Plan states that: "PEF's design standards can be summarized as: 1) quality construction in adherence with current NESC requirements, 2) well defined and consistently executed maintenance plans, and 3) prudent end-of-life equipment replacement programs. When these elements are coupled with a sound and practiced emergency response plan, construction grades as defined by the NESC provide the best balance between cost and performance." Plan at 4. In addition, responding to Staff

Interrogatory No. 7, regarding the process by which Progress measured the percentage of storm hardening on a project-by-project basis, Progress references the Asset Investment Strategy (AIS) Model Summary Report, included as Attachment E to its Plan Supplement.

Q. Does the Company's decision not to use EWL criteria for new construction, planned work, expansions, rebuilds and relocations meet the desired objectives of enhancing reliability and reducing restoration costs and outage times in a prudent, practical and cost-effective manner?

A. Yes. Compliance with the applicable grade of construction required by the NESC—which is Grade C or B as applicable for poles 60 feet or less in height—will meet the Commission's objectives as long as other initiatives—such as vegetation management, increased guying, small conductor replacement and replacing rotten poles—are implemented.

Deployment Strategy

Q. Does the Company's Plan adequately describe the Company's deployment strategy, including the facilities affected, the technical design specifications, construction standards and construction methodologies employed, the communities where electric infrastructure improvements are to be made, the extent to which improvements involve joint use facilities, and the costs and benefits of the proposed Plan as required by Rule 25-06.0342(4)?

A. For the most part, yes, the Plan adequately *describes* its deployment strategy. Rule 25-06.0342(4), F.A.C., regarding the deployment strategy is quite specific about the level of detail required in the storm hardening plans. The Rule requires each utility to explain the systematic approach it will follow to achieve the desired objectives. The deployment strategy details that must be included in each storm hardening plan are broken down into subsections (a) thru (e).

The Company's deployment strategy is set forth at pages 9 - 13 of the Company's Plan. Progress's deployment strategy includes retaining Davies Consulting, and the development of a program to assist in prioritizing hardening projects. The model performs a cost-benefit analysis of: overhead to underground conversions; small wire upgrades; back lot to front lot line relocations; submersible UG; and alternative NESC standards, including Grade B and EWL pilot projects.

Q. In what way, if any, is the description of the Company's deployment strategy lacking?

A. First, the Plan does not adequately identify the costs and benefits of its proposed Plan on third party attachers. However, Progress has agreed to a Process to Engage Third Party Attachers pursuant to which it will provide updated information about the specific design and construction specifications it will be employing to third party attachers on an annual basis. This should remedy the current lack of details in the Plan.

Q. Can you provide an assessment of the costs and benefits of the Company's Plan on third party attachers at this time?

A. The Company's Plan does not yet include enough specific information about the costs and benefits of its storm hardening plan to enable me to provide a specific estimate of the costs and benefits that the Company's plan will have on third party attachers. The Company's Plan provides cost estimates for 2007, 2008 and 2009 on a project annual basis. It would be helpful to have more details about these costs including if possible an estimate of the incremental costs per mile and more details about the plant with third party attachments that will be impacted by these costs. The Company provided some additional cost information detail in its responses to discovery requests submitted in this Docket. That information is currently being analyzed but no conclusions have been reached at this time.

I can say that the costs that may be recovered from cable operators are tightly prescribed by the FCC. Under the federal scheme, FCTA members pay both make-ready costs—i.e., the cost of making the pole ready for its attachments (including the cost of rearranging existing facilities on the pole, guying the pole to increase strength, or replacing the pole where necessary) and annual rent pursuant to the FCC's rate formula, which assures that pole owners receive the fully allocated costs of accommodating the attachment. The annual pole attachment rent is determined by multiplying the percentage of the total usable space occupied by the pole attachment by the sum of the operating expenses and actual capital costs of the utility attributable to the entire pole. In addition, depending upon the circumstances, cable operators may incur the cost of transferring their facilities to a new pole.

It is clear that cable operators will incur significant additional costs as a result of the Company's Plan and likely will experience significant delays in provisioning service to customers as a result of the new processes and standards the Company is adopting in connection with storm hardening. These delays likely will result in lost customers.

From the information I have seen thus far I do see a corresponding benefit to third party attachers resulting from some of the storm hardening activities that Progress is planning. I also believe that more detailed information about the specific design and construction criteria that will be used, and the specific joint use poles that will be impacted, will better enable third party attachers to assess the costs and benefits to their operations.

Q. Does the proposed Process to Engage Third Party Attachers alleviate your concerns about the level of detail in Progress's Plan?

A. Yes. The Process to Engage Third Party Attachers that has been agreed to by Progress sets forth a mutually satisfactory process for continuing the dialogue between utilities and

third party attachers, including reasonable advance notice to, and a process for incorporating feedback from, third party attachers. This goes a long way toward alleviating my concerns about the level of required detail that currently is missing from Progress's Plan.

Q. Is the Company's deployment strategy prudent, practical and cost-effective?

A. From the information that is provided by Progress, it appears that Progress's deployment strategy is prudent, practical and cost effective. Progress intends to focus its distribution, efforts on vegetation management, wood pole inspections, small conductor replacement, good maintenance practices and other Storm Preparedness initiatives. These are the fundamentals necessary for distribution reliability and should not be neglected. Progress will use overhead to underground conversions in lieu of EWL on 19 major highway crossings and conduct one EWL pilot project. Progress will also allocate significant funds and resources to building all new and replaced transmission facilities to EWL steel or concrete poles. These are prudent, practical, and cost effective approaches to storm hardening.

Q. Has Progress explained the methodology it will use to assess pole strength for purposes of determining whether a pole should be replaced?

A. Yes.

Q. Do you agree with the methodology being employed by Progress to assess pole strength?

A. For the most part, yes. Progress plans to use PoleForeman pole loading analysis software to perform its comprehensive pole loading analysis. I am concerned that PoleForeman may not take into account all of the relevant criteria for assessing the true strength of the pole and its ability to withstand wind loading. For example, I do not believe that PoleForeman takes into account the guying effect of lateral lines on the pole without special application procedures. Considering that pole loading calculations with computer

software, as opposed to the engineering guidelines, tables and charts that have served very well for electric utility distribution design for decades, is new to Progress and many others, extra caution should be used to be certain that beneficial as well as detrimental loading effects on poles are included in the sophisticated calculations.

Q. Please explain what you mean by the guying effects of lateral lines and other beneficial loading effects of guy wires on poles.

A. Poles or any tower can be designed to be held upright by as few as three guy wires when nothing else is attached. A guy wire is a strong steel wire which is attached to a pole near the height on the pole where the pole needs additional support. The other end of the guy may be attached to a strong steel anchor in the ground or to another pole in the direction that the pull of the guy is needed. The requirements are that the guys and their anchors must have enough strength to overcome the horizontal force of wind on the structure. The structure must have enough strength to withstand the vertical load, if any, of the guys' downward component of pull on the tower. The horizontal component of the pull of the guys is what must equal or exceed the applied force of the wind.

Power lines near the top of the poles create the effect of having two sets of "guys" attached to the poles. These wires are much stronger than the tension at which they are strung from pole to pole. The amount that the strength of each of these wires exceeds the pounds of tension on the wire is available to help strengthen the pole in that direction. This is the same effect on pole strength as guying. The lines are either straight through, turn an angle or stop on each pole. The straight line poles are called tangent structures, the angles are angle structures and the last ones are called dead end poles.

A tangent structure must have enough strength to withstand the force of the assumed speed of the wind for which it is designed. The wind direction must be assumed to be that which results in the most load on the pole. For a tangent pole with no other

wires or guys attached, the worst direction is perpendicular to the line because of the ability (guying effect) of the line to support the pole in two directions as stated above. The wind force is based on the exposed surface area of the structure and all of its attachments. This strength may be provided by the structure alone or other support such as guy wires and other electric wires and cables attached to the pole. These other attachments leave individual poles in various directions and at different heights. All of these attachments must have greater strength than the tension under which they operate. The operating tensions and strength of various wires and cables generally is known and the tension depends on the distance to the next pole. The amount that the strength of any attachment exceeds its operating tension produces a guying effect on the pole.

Angle poles are similar to a tower which is guyed three ways. The line provides guying effects in two directions and the third is provided by a guy and anchor, a horizontal guy wire to another pole or another line leaving the pole and acting as a guy. A dead end pole normally is strengthened in one direction by the power lines and by a guy wire or guy wires in the opposite direction. Dead end poles can be guyed if space is available by two guys whose anchors are spread apart enough to effectively storm guy the pole. The horizontal component of all of these guying effects can and often does make a common diameter pole strong enough to meet EWL or Grade C standards.

Q. Do you have an understanding of how Progress considers these guying effects on poles?

A. No. Progress has discussed this concern with me but it is not yet clear to me how PoleForeman can be utilized to account for the *guying effects* of other lines, cables and guys on poles in the evaluation of the strength of a given pole. If these guying effects are not taken into account, many poles strong enough to meet grade C, or Grade B or even EWL, may be changed out unnecessarily by Progress at great expense. We all have a common interest in resolving this question.

Third Party Attachment Standards And Procedures

Q. Does the Company maintain standards and procedures for attachments by others that meet or exceed the NESC?

A. Yes. Progress's attachment standards and procedures for third party attachments included in its Plan meet or exceed the provisions of the NESC that are relevant to this proceeding which, as I have stated above, are Sections 24 thru 26 relating to strength and loading requirements including the effect of wind on the poles and attachments. *Se,e e.g.,* Plan at 22 and Attachment J.

Q. Do the third party attachment standards and procedures included in the Company's Plan comply with the requirements of Rule 25-6.0342(5), F.A.C.; i.e., do they meet or exceed the edition of the NESC that is applicable, so as to assure, as far as is reasonably practicable that third party attachments do not impair electric service reliability or overload the pole, and are constructed, maintained and operated in accordance with generally accepted engineering practices for the IOU's service territory?

A. No.

Q. Why not?

A. First, Progress includes in its plan submitted to the FPSC for approval certain terms and conditions governing third party attachments that are not related to the Commission's overall objective of enhancing electric reliability or reducing restoration costs i.e., storm hardening. Only standards and procedures that concern the loading impact of third party attachments on the strength of poles relate to storm hardening and should be in the plans. Second, some of the third party attachment standards and procedures do not "assure as far as reasonably practicable that third party attachments do not impair electric safety, adequacy, or pole reliability, do not exceed pole loading capacity, and are constructed, installed, maintained, and operated in accordance with generally accepted engineering

practices for the utility's service territory," and therefore should not be approved. The meaning in the NESC of practicable has always been that something must not only be possible but that it must also be practical as well.

Q. Please explain which terms and conditions governing third party attachments included in Progress's Plan are not related to the overall storm hardening objective?

A. Progress's Joint Use Pole Attachment Guidelines reflect that, if the attacher fails to install identifying tags or, when an attacher's facilities are acquired by another entity, if the acquiring entity fails or refuses to retag its facilities within the one-year time allotted, Progress may deem the attacher in violation. These requirements are extremely stringent and should not be approved in the context of the storm hardening initiative. Progress recently, for purposes of its pole attachment audit, unilaterally modified its definition of "attachment," which has resulted in a significant increase in the number of attachments Progress has deemed "unauthorized." These types of terms and conditions should simply not be included in the Plan. Indeed, these provisions constitute rates, terms and conditions of attachment which are governed by pole attachment agreements between the parties and fall within the jurisdiction of another regulatory body, particularly the FCC, which under statute has exclusive authority to regulate the "rates, terms and conditions for pole attachments to provide that such rates, terms and conditions are just and reasonable" in non-certified states such as Florida.

Q. Which of Progress's attachment standards and procedures address the loading impact of third party attachments on the pole and thus, concern storm hardening?

A. Only those provisions pertaining to the loading effect of third party attachments on the pole are relevant to the concerns raised in this proceeding. The attachment standards relating to cable diameter, weight and installed tension and guying standards as well as identifying the poles affected are relevant. For instance, Progress's attachment standards

and procedures mandate that all new attachments, as well as overlashing, require a permit, and states that permit applications must include the cable or overlashing specifications and the pole(s) on which attachments or overlashing is requested, and must comply with guying standards.

Q. Are all of these attachment standards and procedures that concern storm hardening prudent, practical and cost effective?

A. No. In particular, Progress's requirements for overlashing are not. Progress requires full permitting for overlashing. See Plan Attach. A, Progress Energy Joint Use-Pole Attachment Guidelines & Clearances, PGN Drawing 09.04-01. My understanding is that permitting is regulated by the FCC as a term and condition of attachment, and that the FCC has stated that utilities may not require permits for overlashing. Rule 25-6.0342(8), F.A.C. provides that "Nothing in this rule is intended to conflict with Title 47, United States Code, Section 224, relating to FCC jurisdiction over pole attachments." Moreover, it is not prudent, practical or cost effective to require permitting or a complete loading analysis for overlashing.

Q. Please explain what is meant by "overlashing."

A. What a cable operator initially attaches to the pole (i.e., a "new attachment") is not usually the coaxial or fiber conductor itself, but a steel wire support strand attached to the pole with a clamp and through bolt. The operator then places communications conductors parallel to the strand and secures them by wrapping the strand and the conductor(s) with a thin steel filament called a lashing wire applied by a lashing machine. The cables are not wrapped around the support strand. Through the life of the plant, the cable operator may alter that plant, including by *lashing* additional conductors to the existing strand, i.e., overlashing. For example, growing neighborhoods may be served by lashing additional or rerouted trunk cables to the existing strand, using another filament lashing the new line to

the existing strand. More often, in today's applications, fiber optic sheath is "overlashed" to the coaxial cables in order to increase bandwidth and to provide capacity to offer new services. In addition, operators use overlashing in emergency situations to repair customer outages. Overlashing is used to eliminate amplifiers (which are potential points of failure); to expand channel capacity; and to provide capacity for additional services. Overlashing does not use more pole space, because the same strand remains attached to the same licensed position on the pole. Indeed, it is common for more than one cable to be held in place by lashing it to an already existing and already licensed strand or messenger.

In my experience third party attachments do not significantly increase the load on poles, and overlashing has only a very small incremental effect on the already attached strand and cable assembly. Rather, power lines, hardware for attaching lines to poles and power apparatus such as transformers, fused switches, lightning arrester assemblies, outdoor lights and many other power company attachments usually account for most of the wind load on a pole because they have a larger cross sectional area and are attached to the top part of poles. Wind load is a product of the surface area exposed to the wind multiplied times the force of the assumed wind and also multiplied times the pole height from the fixed point (often the ground line or the lowest guy wire) on the pole. As stated above, today's overlashing typically is of fiber optic sheath—a very light weight material that is quite small in diameter. A common fiber optic cable is .59" diameter and weighs .05 pounds per foot. Thus, overlashing will not in the large majority of cases bring a pole out of compliance.

Q. What do you propose as a prudent, practical and cost effective solution for overlashing?

A. I recommend that cable operators be permitted to overlash existing strand provided that they assess the loading impact on the pole within 30 days of overlashing. To the extent

that the loading analysis demonstrates that the overlashing brings the pole out of compliance (or, as is more likely to be the case when poles are found to be overloaded, that the pole was already out of compliance) the operator should notify the pole owner, and make-ready should be planned.

Q. Is this ever done?

A. Yes, all the time. In fact, other Florida utilities, including TECO, have been doing this in practice for years. Progress only recently, in 2004, instituted any requirements for overlashing. Historically, Gulf Power Company did not perform any loading analysis on the poles caused by overlashing. Tellingly, of the four utilities that filed storm hardening plans on May 7, 2007, not one has pointed to a single instance in which overlashing has caused a pole failure in response to FCTA's interrogatories on the subject.

Q. Is your suggested approach consistent with the NESC?

A. Yes. The NESC is a performance standard. The NESC rules provide for what is to be accomplished. The utilities covered by the NESC, including power and communications companies, all have practicable industry practices and reasonable engineering guidelines available to assure compliance with the rules. An exhaustive engineering loading analysis on every pole is not necessary or practicable every time a communication or power attachment is added or modified on a pole. Indeed, given the delays and expense associated with a full engineering loading analysis for overlashing, and the likelihood that the overlash will not be a factor contributing to any overload, any such requirement would not be cost-effective, prudent or practical.

Q. Is this consistent with generally accepted engineering practices for the utility's service territory?

A. Yes. Several Florida pole owners and pole owners throughout the southeast allow cable operators to overlash existing strand and notify the pole owner after the fact. It is

common practice throughout the industry to allow cable operators to notify pole owners after the fact that they have attached to a "drop" pole—i.e., an oftentimes shorter pole used to carry a few service lines to a residence or business.

.Q. Are you suggesting that overlashing should be permitted to bring a pole out of compliance?

A. No. First, it is highly unlikely that the incremental wind load caused by overlashing will bring the pole out of compliance. The strand-supported coaxial cable that typically comprises the initial attachment, is itself one of the attachments that contributes the least to the wind loading of the pole. The wind load is determined by the diameter and length of wires and cables attached to poles as well as the diameter of the pole and the area of equipment on the pole. The area of each attachment is multiplied times the wind force and its attachment height. The wind load, expressed in foot pounds, causes a mechanical "moment" on the pole at the ground line. The final step in the calculation is to multiply the wind load on each attachment times the height of the attachment above ground i.e., the moment arm.

Coaxial cables, used by cable television companies, are smaller and lighter than the common multi-conductor copper communications cables used by telecommunications carriers. Moreover, initial attachment of strand-supported cable plant is handled through the application and make-ready process where the pole strength is evaluated and determined to be adequate. Even lighter than coaxial cables, however, are the fiber optic conductors which are most commonly used for cable television construction today. Indeed, .59-inch fiber optic conductors weigh only 50 pounds per 1000 feet.

In contrast, there are typically three power wires attached to the top of poles (primary voltage wires) with the neutral and secondary wires a few feet below the primaries but at least 40 inches above the highest communication cable. These wires

frequently weigh more than coaxial cable. Power equipment mounted on poles above communications cables also adds wind load as well as the surface area of the pole itself. All of the power lines and equipment wind loads have to be multiplied times the longer moment arm determined by their higher attachment points above ground.

For all of these reasons and more, the loading effect of cable plant is often treated as insignificant in utility practice. The loading effect of overlashing is even less significant. In my experience, I have found no instance in which overlashed fiber was the "straw that broke the camel's back" by pushing an otherwise compliant pole into violation of applicable loading criteria.

Second, any slight non-compliance that might possibly be caused by overlashing could be quickly remedied. Attachers would be required to notify the pole owner within 30 days of overlashing and/or would assess the loading on the poles themselves.

Q. Do you think that even overlashing resulting in significantly increased size bundles should be allowed without prior notice?

A. At a minimum, I think there should be some incremental load for overlashing that does not require a full blown loading analysis. For incremental loads that exceed an agreed upon threshold, I believe that a loading analysis can be performed by the attaching entity with the results provided to the pole owner.

Q. What is the standard adopted by New York?

A. The rule adopted by the New York PSC provides that "a predetermined limited amount of overlashing, that is not a substantial increase to existing facilities, shall be allowed," without notification and allows the attacher itself to make the determination. Specifically, "[a]n Attacher, [sic] whose facility has a pre-existing NESC calculated span tension of no more than 1,750 lbs., shall be allowed to overlash a pre-determined maximum load of not more than 20% to the existing communications facility. Existing

facilities with an NESC calculated span tension of less than 1,000 lbs. shall be allowed a pre-determined overlash of up to 40% of such pre-existing facilities." *Proceeding on Motion of the Commission Concerning Certain Pole Attachment Issues*, Order Adopting Policy Statement on Pole Attachment, 2004 N.Y.P.U.C. LEXIS 306, *30 (N.Y.P.U.C. rel. Aug. 6, 2004). If the attacher "determines that the addition of equipment and loading is greater than the pre-determined limits, further assessment of the overlashed facility for its impact on the overall pole loading is required to assure that the pole limits are not exceeded." *Id.* In those cases, the attacher would be required to "provide the pole Owner with a 'worst case' pole analysis from the area to be overlashed, to be sure that the additional facilities will not excessively burden the pole structures." *Id.*

Q. In your experience does the relative placement of cable operators' strand and overlash in the communications space on the poles have any beneficial effect on the stability of the pole or ability to withstand wind and other forces?

A. Yes it can.

Q. Would you please explain?

A. Cable plant is deployed similar to power and telephone plant on pole lines. However, due to the needs of each utility the cable television lines often turn or "pull off" the power pole at locations where the power lines do not turn. This pull off must be guyed unless it pulls off in two opposite directions as at some street crossings. These pull off cable lines with their steel messenger wires provide guying effects on the affected poles which strengthen the pole substantially because the pole is supported at 18 to 22 feet high. It is the same effect as storm guying. This helps keep the poles in a run stable and minimizes cascading as the strand helps keep the lateral poles from pulling down adjacent poles, thus keeping the circuits intact and causing fewer outages, unless of course there is a tree collapse, in which event it is likely no design feature could keep the facilities from being damaged.

Third Party Input

Q. In establishing its Plan did the Company seek input from and attempt in good faith to accommodate concerns raised by third party attachers?

A. Yes, to an extent. The Company did seek input from third party attachers. It conducted meetings with attachers early in the process to receive comments and concerns from attachers. Thereafter, the Company submitted its Plan to the attaching parties and asked for feedback. However, because of the limited information provided by the company in the Plan concerning the projects for 2008 and 2009, the incremental costs associated with storm hardening, and the joint use poles that would be impacted, third party attachers were unable to identify all of their concerns or to provide a cost/benefit assessment of the Plans on third party attachments.

The cable operators did provide specific feedback concerning the Company's attachment standards and procedures for third party attachments, and Progress did make some small changes based on this feedback. While the level of input that third party attachers have been able to provide to date does not completely meet the requirements of the rule, and Progress and FCTA have not resolved all issues there is reasonable expectations that the issues can be resolved. Indeed, the Process to Engage Third Party Attachers that has been agreed to by Progress sets forth a mutually satisfactory process for continuing the dialogue between utilities and third party attachers, including reasonable advance notice to, and a process for incorporating feedback from, third party attachers. This goes a long way toward alleviating my concerns about the level of required detail that currently is missing from Progress's Plan.

Q. Does that conclude your testimony?

A. Yes.

MR. SEIVER: Thank you. And we will deal with the exhibits to the Progress testimony as to, with all of Mr. Harrelson's exhibits at the conclusion of the cross-examination in the FPL docket, or, if we resume Tampa, at the conclusion of that docket.

CHAIRMAN EDGAR: Yes. Thank you.

MR. SEIVER: And since we have withdrawn Gulf Power, I believe the next testimony that we have for Mr. Harrelson is in the Florida Power & Light docket.

CHAIRMAN EDGAR: Yes.

MR. SEIVER: Thank you.

MICHAEL T. HARRELSON

was recalled as a witness on behalf of Florida Cable Telecommunications Association and, having been duly sworn, testified as follows:

DIRECT EXAMINATION

BY MR. SEIVER:

Q And so, Mr. Harrelson, were you here yesterday when the witnesses were sworn?

A Yes, I was.

Q And you are Michael T. Harrelson?

A Yes, I am.

Q And did you submit testimony in the Florida Power & Light docket, 070301, on behalf of the Florida Cable Telecommunications Association?

A Yes, I did.

Q And if I were to ask you the questions in that prefiled testimony today, would your answers be the same?

A Yes.

Q Are there any errors -- any changes or corrections to that?

A Not that I'm aware of, unless -- I heard some discussion about a stipulation that might take some pages out. I'm not sure.

MR. SEIVER: I'm sorry. We had some changes in the exhibit numbers, but we'll deal with that when we move the exhibits in at the end.

CHAIRMAN EDGAR: Okay.

BY MR. SEIVER:

Q Mr. Harrelson, would you please give a summary of your testimony?

MR. BUTLER: Excuse me, Madam Chairman. Before Mr. Harrelson summarizes his testimony, it was my impression that consistent with the stipulation we had on, on Issue 51 that FCTA was going to be withdrawing portions of Mr. Harrelson's testimony, and now seems like the right time to do it, if it's going happen.

MR. SEIVER: I apologize.

CHAIRMAN EDGAR: Okay. Mr. Butler, thank you for bringing that to our attention. Can you address that for me,

please?

MR. SEIVER: Thank you, Madam Chair. And I apologize, Mr. Butler. I have the note right here and I still didn't see it.

Yes. Madam Chair, to modify our moving the testimony in, we need to withdraw in Mr. Harrelson's prefiled direct testimony Page 36 beginning with Line 3 through Page 45, Line 14.

MR. BUTLER: Thank you.

CHAIRMAN EDGAR: Okay. So am I -- let me make sure I understand, and we'll work together to get where we need to be. So we are going to enter the prefiled direct testimony of this witness, with the exclusion of Page 36, Line 3 through Page 45, Line 14.

MR. SEIVER: Yes, Madam Chair. That is correct.

CHAIRMAN EDGAR: So noted for the record.

MR. SEIVER: Thank you.

CHAIRMAN EDGAR: Thank you.

Introductory Issues

Q. Please state your name, title, and business address.

A. My name is Michael T. Harrelson. I am a registered professional engineer (Electrical), and an engineering consultant.

Q. On whose behalf are you filing this testimony?

A. I am appearing on behalf of the Florida Cable Telecommunications Association, Inc. ("FCTA"), an intervenor in this proceeding.

Q. Would you please summarize your education, experience and qualifications?

A. Certainly. I have a Bachelor of Science in Industrial Engineering from Georgia Tech where I was a co-op student while working for Georgia Power Company. I started working at Georgia Power in electric distribution in their co-op program in 1963 when I was 18. I was at Georgia Power in various districts and in various capacities of electric distribution, engineering, construction and maintenance until 1992. In 1992 I began a career as an Engineering Consultant. I am a registered professional engineer in Georgia and Florida. A more detailed rendering of my work history is included in my CV which is attached as Harrelson Exhibit 1 ("MTH-1").

Q. Have you had any experience in working with joint use of electric distribution poles by communications companies?

A. Yes. I have had extensive experience in this area.

Q. Do you have knowledge of the National Electrical Safety Code ("NESC")?

A. Yes, I do. The NESC is the national safety standard for electric supply stations and electric supply and communication lines. The current edition is ANSI C2-2007, ISBN No. 0-7381-4893-8. The purpose of the NESC is the practical safeguarding of persons during the installation, operation, or maintenance of electric supply and communication

lines and associated equipment. This code is not intended as a design specification or as a construction manual. The NESC rules contain the basic provisions that are considered necessary for the safety of employees and the public under the specified conditions. If the responsible party wishes to exceed these rules, he may do so for his own purposes, but need not do so for safety purposes. NESC compliance is mandatory in Florida for electric power and communications companies.

Q. Do you consider yourself knowledgeable in these areas?

A. Yes. I consider myself to be an expert in the NESC and its application to construction, installation, maintenance, inspection, and audit of electric and communications facilities on poles.

Q. Why is that?

A. I worked for Georgia Power Company for a total of 27 years, including during the late 1960s and early 1970s when the first cable television systems were being built in Georgia and elsewhere around the country. Because I worked for Georgia Power until 1992, I also witnessed the upgrade and rebuild of improved generations of cable television systems and saw how both cable companies and pole owners, including power companies, work together to complete these system upgrades and rebuilds. Since retiring from Georgia Power, I have worked as a consulting engineer and an expert witness to electric companies, cable companies and others.

Q. Have you ever been qualified as an expert witness?

A. Yes.

Q. In what subjects or fields have you been so qualified?

A. I have been qualified as an expert in (1) the NESC requirements; (2) electric power distribution design, construction, engineering, operation, and maintenance procedures; (3) joint use of utility poles by power and communications companies; (4) OSHA electric

power and communications safety regulation; and (5) the National Electric Code, which applies to electric power utilization systems.

Q. On how many occasions have you given testimony as an expert witness in these areas?

A. I have testified either in deposition or at trial approximately 41 times in the past 18 years. I testified in a pole attachment dispute before the Utah Public Service Commission in a matter closely related to some issues in this proceeding. That dispute involved attachment permitting procedures, engineering guidelines for attachments, and interpretations of the NESC. In addition, in a similar dispute in Arkansas, I submitted written testimony to the Federal Communications Commission ("FCC") and participated in a mediation session before the FCC. I have also submitted written comments to the Louisiana Public Service Commission in a proceeding to reconsider regulations regarding pole attachment procedures in Louisiana. Moreover, in the spring of last year I gave deposition testimony, submitted direct testimony and testified live on cross examination before the Chief Administrative Law Judge ("ALJ") at the FCC on behalf of the FCTA and four of its member operators. The issue in that proceeding was whether Gulf Power was entitled to charge pole attachment rates in excess of rates produced using the FCC formula for cable operator attachments based on, among other things, Gulf Power's claim that its poles were "full" and that no capacity for further attachments existed. I testified that safe and customary engineering practices, based on my years of experience and the NESC, demonstrated that Gulf Power's poles had capacity and the Chief ALJ agreed with my analysis. The matter is now on appeal. I also participated in the Florida Public Service Commission (hereinafter "FPSC" or the "Commission") rulemaking proceeding in Dockets No. 060172-EU and 060173-EU, through which Rule 25-6.0342, Florida Administrative Code ("F.A.C."), was developed. Furthermore, I submitted Comments to this Commission in the Storm Preparedness proceeding, Docket No. 060198-EIQ.

Q. Do you have additional relevant experience?

A. Yes. I have participated in more than 100 pieces of litigation or accident investigations as a consultant.

Q. Are there other aspects of your training and background that may be relevant to your testimony?

A. Yes. In addition to working in this industry for quite a number of years, I regularly attend conferences on joint use, conduct training sessions and conduct pole-line inspections for pole owners like electric utilities, not unlike the inspections that are, at least in part, at issue in this proceeding. Through these activities I am very familiar not only with standard industry practices as they relate to outside aerial utility plant and joint use, but I am also very familiar with the trends and "state-of-the-art" utility and communications company practices in this area.

Q. Have you had experience with hurricanes in South Florida?

A. Yes. I worked in South Florida for an electric cooperative in restoration of service after Hurricanes Jean, Francis, Charlie and Wilma. I personally observed the destruction of trees and buildings and their impact on distribution lines, as well as the poles leaning in softened soil and cascading failures caused by one pole being broken that resulted in several more poles being broken. I saw places where several poles broke and fell in one direction but several adjacent poles in the same line fell in the opposite direction indicating tornado type winds in localized areas. The greatest numbers of power outages were caused by tree limbs and broken wires, not broken poles.

Q. Has your work been limited to field work?

A. No. I have consulted as a Registered Professional Engineer in joint use contract interpretation and application for 15 years. This includes inspecting joint use facilities, training field engineers and line workers in the NESC, joint use contracts and safe-work

rules, and negotiating specific separation, clearance and arrangement requirements (which are additional requirements sometimes imposed by power companies). I have also negotiated procedures, techniques and schedules to complete safety audits, make-ready engineering, make-ready construction and post inspection for joint use projects. I have prepared and conducted numerous workshops or seminars for national joint use conferences and personally conducted several NESC code compliance audits, as well as prepared the make-ready engineering for the power companies and communications companies involved that was necessary to correct violations uncovered in those audits.

Q. Anything else?

A. Yes. In the past I have been President of the local utility coordinating committees in Brunswick and Milledgeville, Georgia and periodically attend national joint use conferences.

Q. Please describe your work as President of the local utility coordinating committees.

A. These are organizations that are established to foster better communication among the different industries and users that need to use poles and be in the right-of-way. We discuss, design and implement ways to accommodate safe, practical and timely access and use of the limited facilities that all these different companies need to provide their services.

Q. Do these committees facilitate joint use of poles?

A. Yes, in part. Other issues such as joint trenching, right-of-way restoration, tree-trimming and the like have also been considered. But the principal motive for these particular organizations and ones like them is to provide a forum for inter-industry understanding and to find real-world solutions to real-world problems in the joint use area.

Q. Are you sponsoring exhibits in this case?

A. Yes. MTH-1 (my curriculum vitae and list of testimonies); MTH-2 (CIF projects – Lateral Line and Other Guying Effects: Lake City Veterans Administration Hospital (Columbia County) and Lee County Memorial Hospital (Fort Myers)); MTH-3 (CIF projects – Large Trees by Hardened Lines: Lake City Veterans Administration Hospital (Columbia County) and Lee County Memorial Hospital,(Fort Myers)); MTH-4 (Affidavit of Dr. Lawrence M. Slavin Supporting Initial Comments of Verizon Florida, Inc. in Docket Nos. 060172-EU and 060173-EU ("Slavin Affidavit")); and MTH-5 (Process to Engage Third Party Attachers.

Q. Could you please explain what your assignment from FCTA was in this proceeding?

A. Certainly. My assignment was to evaluate the Storm Hardening Plan (the "Plan") filed by Florida Power & Light Co. (hereinafter "FPL" or the "Company") in this docket for the purpose of determining whether the Plan meets the overall objective of the Commission, as set forth in Rule 25-6.0342, F.A.C., of enhancing the reliability of electric transmission and distribution service in a prudent, practical and cost-effective manner. In my testimony, I will address the extent to which the Company has adopted extreme wind loading (EWL) standards for new construction, major planned work and critical infrastructure projects, the deployment strategy the Company will follow to implement those standards, and whether the adopted standards and deployment strategy meet the Commission's overall objectives. I will also address the extent to which the standards and procedures for third party attachments included in the Plan meet or exceed the NESC to assure as far as reasonably practicable that third party attachments do not impair electric service reliability or overload the pole, and are constructed, maintained and operated in accordance with generally accepted engineering practices for the investor-owned utility's (IOU) service territory. I will also address the extent to which the Company sought and attempted in good faith to accommodate input from attaching entities. I will also address

the Direct Testimony and Exhibits submitted by Manuel B. Miranda presenting the Company's Plan as well as responses to Interrogatories and document requests submitted by the Company.

Q. How do the provisions of the Company's Plan impact the cable operators who are attached to the Company's poles?

A. Cable operators rely on telephone and increasingly power company (who own collectively approximately 80% of the poles statewide) pole infrastructure to distribute video, voice and broadband services to over five million residents throughout the state of Florida. Cable operators are in an intensely competitive industry (competing with satellite operators and telephone companies) and have a fervent interest in ensuring that poles stay up—and their facilities too—to minimize service interruptions, provide access to the Internet, phone service, cable service and important emergency and information services. FCTA and its members also are interested in ensuring that the State's utility poles are safe and reliable and that construction, maintenance and inspection costs are reasonable. Because of quality service objectives and competitive pressures, cable operators must be sure there are no unreasonable delays in attaching or overlashing cables that would delay provisioning of service to customers, or unreasonable costs imposed that would jeopardize their ability to invest in new and innovative services. Cable operators pay rent based upon the fully allocated cost of the pole space occupied by the cable operator's attachment. Cable operators also directly reimburse utilities for the cost of making the pole ready for their attachments, and pay to make the pole compliant with the NESC when a cable operator is responsible for bringing the pole out of compliance. One of my biggest concerns is that all of these costs threaten to go up significantly due to the Company's Plan and cable operators could face additional delays in provisioning important services to their customers that are not related to pole safety and reliability. I will address these and

related issues below in reference to the Company's Plan and the relevant statutory and regulatory requirements.

Q. What is your understanding of what the Company's Plan must do to comply with Rule 25-6.0342, F.A.C.?

A. It is my understanding that under that provision the Company's Plan must meet the overall objective of enhancing the reliability of electric transmission and distribution service and reducing restoration costs and outage times in a prudent, practical, and cost-effective manner to the affected parties.

Q. Could you please give us details on what the Plan must include to meet those requirements?

A. Yes. First, the Plan must address the extent to which the Company complies with the NESC. Second, the Plan must address the extent to which it employs the EWL standards specified by Figure 250-2(d) of the 2007 edition of the NESC for new construction, major planned work, and critical infrastructure projects to achieve the objective of enhancing reliability and reducing restoration costs in a prudent, practical and cost effective manner. Third, the Plan must include a detailed description of its deployment strategy, including the facilities affected, the technical design specifications, construction standards, and construction methodologies employed, the communities and areas affected, the extent to which joint use facilities are affected, an estimate of the costs and benefits of the Plan generally, and an estimate of the costs and benefits of the Plan for third party attachers, and explain how the deployment strategy meets the desired objectives of enhancing reliability and reducing storm restoration costs and outage times associated with extreme weather events in a prudent, practical and cost effective manner. Fourth, the Plan must demonstrate that the Company maintains standards and procedures for third party attachments that meet or exceed the NESC so as to assure as far as reasonably practicable

that third party attachments do not impair electric service reliability or overload the pole, and are constructed, maintained and operated in accordance with generally accepted engineering practices for the IOU's service territory, and do not conflict with Title 47, United States Code, Section 224, relating to FCC jurisdiction over pole attachments. Lastly, the Company must show that, in developing its Plan, it sought input from, and attempted in good faith to accommodate concerns raised by, third party attachers such as cable operators.

Company Plan

Q. Have you read the Storm Hardening Plan filed by the Company in the referenced docket?

A. Yes.

Q. Have you reviewed the Direct Testimony and Exhibits of the Company's witness, Manuel B. Miranda, dated August 24, 2007 filed in support of the Company's Plan?

A. Yes.

Q. Have you reviewed the answers to interrogatories and responses to document requests filed by the Company to date in this proceeding?

A. Yes.

Q. Should the Commission find that the Company's Plan meets the desired objectives of enhancing the reliability of overhead and underground electrical transmission and distribution facilities and reducing restoration costs and outage times in a prudent, practical and cost effective manner?

A. No.

Q. Why not?

A. First, the Company's plan to apply EWL criteria to all new construction, major planned work and daily work in addition to critical infrastructure facilities and interstate crossings is not prudent, practical or cost effective. Second, the Company has not provided the

detailed description of its deployment strategy for years 2008 and 2009 that is required by Rule 25-6.0342(4), F.A.C. Third, certain aspects of the Company's deployment strategy are not prudent, practical or cost-effective. Fourth, certain of the Attachment Standards and Procedures set forth in the Plan do not relate to storm hardening but instead concern rates, terms and conditions that are regulated by the FCC, and others are not *reasonably practicable* as required by Rule 25-6.0342(5), F.A.C. Lastly, the Company has not fully satisfied its obligation to seek and attempt in good faith to accommodate concerns of third party attachers such as FCTA members.

Wind Loading Standard

Q. Does the Company's Plan address the extent to which, at a minimum, the Plan complies with the current edition of the NESC, ANSI C2-2007, as required by Rule 25-6.0342(3)(a)?

A. Yes. The Company's Plan addresses the extent to which it complies with the NESC to the extent required by Rule 25-6.0342(3)(a), F.A.C., at pages 7 and 8. This rule concerns strengthening poles to withstand extreme weather conditions produced by hurricanes—i.e., extreme wind. The relevant NESC rules are those that address strength and loading, including the effect of wind on the poles, which rules are located in Sections 24 (Grades of Construction), 25 (Loadings for Grades B and C) and 26 (Strength Requirements) of the NESC. It is my understanding that other provisions of the NESC, including those related to clearances between electric and communications facilities, are not at issue in this proceeding. FPL does not address those requirements, but refers to them, and therefore, I am not expressing an opinion on those provisions except to point out which ones fall outside the scope of this proceeding and therefore should not be approved. With this understanding, the Company's Plan addresses the extent to which it complies with the NESC to the extent required by F.A.C. 25-6.0342(3)(a).

Q. Does the Company's Plan comply, at a minimum, with the relevant provisions of the NESC?

A. Yes. The NESC specifies required pole line strengths for distribution lines using grades of construction including Grades B, C and N. The required grade of construction depends upon the voltage of the circuits carried on the pole and what the circuits cross over. Grade B design results in at least an "equivalent wind" strength of approximately 116 mph, and is thus "stronger" than Grade C design, which has at least an "equivalent wind" strength of approximately 86 mph. The NESC generally requires Grade C construction for "distribution" facilities 60 feet or less in height. Grade B is required for certain crossings, including railroad tracks, limited-access highways, and navigable waterways requiring waterway crossing permits. FPL states in its Plan that the Company historically designed all of its distribution facilities using Grade B loading criteria, except between 1993 and 2004 when it used Grade C construction in a portion of its territory. Accordingly, FPL's distribution facilities already meet, and in most cases exceed, the minimum requirements of the NESC. FPL's Plan to adopt the NESC's EWL criteria for all new construction, major planned work, critical infrastructure facilities (CIF), and incremental hardening grossly and unnecessarily exceeds the requirements of the NESC.

Q. Does the Company's Plan address the extent to which it is adopting the EWL standards specified by Figure 250-2(d) of the 2007 edition of the NESC?

A. Yes. FPL's Plan at page 3 highlights the Company's plan for hardening its distribution system and states that the Company will apply the NESC EWL criteria to existing and new feeders as well as any associated laterals directly serving CIF, critical poles and designated interstate highway crossings, and to all new overhead facilities, major planned work, relocation projects and daily work activities. It also states that it will

"incrementally harden"—i.e., apply standards up to and including EWL—certain feeders serving community needs such as grocery stores, gas stations and pharmacies.

Q. Does the Company's plan meet the desired objectives of enhancing reliability and reducing restoration costs and outage times in a prudent, practical and cost-effective manner?

A. No.

Q. Please explain your answer.

A. FPL's Plan is not prudent, practical or cost effective. It will dramatically increase costs without adequate assurance of a commensurate improvement in storm performance or storm restoration. FPL has proposed to spend hundreds of millions of dollars to build and rebuild its distribution system to EWL criteria. The plan is applied not only to all of FPL's coastal service territory, but also to its entire inland service territory. It estimates that it will spend up to $61.5 million on hardening efforts in 2007, $125 million in 2008 and another $150 million in 2009 (Plan at 4; Miranda Test. at 14-15), for a combined three year cost of nearly $300 million dollars. These expenditures will be in addition to substantial yearly expenditures that FPL will make on other storm hardening activities which include another $40 million for the distribution pole inspection program and another $90 million on the 10 storm preparedness initiatives, resulting in a total expenditure of almost $500 million. By comparison, Tampa Electric Company's ("TECO") projected expenditures for all of its storm hardening efforts combined for 2007, 2008 and 2009 do not exceed $100 million. Another way of looking at the proposed cost is the cost differential that FPL provides for a Grade B wood pole versus an EWL concrete pole—as much as $8,000 per pole. *See* FPL's Response to Florida Cable Telecommunications Association First Set of Interrogatories, No. 5.

At the same time FPL proposes to spend nearly $500 million on hardening, it acknowledges that it does not yet have a clear sense of the benefits that its investment will generate. FPL's Plan states "it is impossible at this time to estimate the full extent of the benefits with any precision." Plan at 25. Mr. Miranda states in his testimony, "FPL does not have sufficient information at this time to distinguish between the benefits attributable to one type of hardening activity versus another," and "there is little directly measured data on the improved resilience." Miranda Test. at 16. Notwithstanding these uncertainties, in response to Staff Interrogatory Number 38, FPL estimates that over an analytical study period of 30 years, the net present value of restoration costs savings per mile of hardened feeder could be as little as 45 percent of the cost to harden that mile of feeder. Miranda Test. at 18; FPL's Response to Public Service Commission Staff's First Set of Interrogatories, No. 38. In other words, FPL might only recover a benefit of half of every dollar spent on storm restoration. Moreover, as further discussed below, even these minimal perceived benefits are highly suspect, and the Plan as currently expressed might actually have some adverse effects on system reliability and storm recovery.

Q. Does the "The Process to Engage Third Party Attachers" lessen your concerns stated above?

A. Yes. That agreement sets forth a mutually satisfactory process for continuing the dialogue between utilities and third party attachers, including reasonable advance notice to, and a process for incorporating feedback from, third party attachers. This goes a long way toward alleviating my concerns about the level of required detail that currently is missing from FPL's Plan.

Q. Does the NESC require EWL criteria for distribution poles that are 60 feet or less in height?

A. No. Rule 250C of the 2007 NESC contains the EWL standard and describes the application of the extreme wind loading required in Rule 250A1 on poles and their supported facilities, including wires, transformers, etc. for purposes of determining the required strength of the pole. The current edition of the NESC exempts from the EWL criteria any structure and its supported facilities that are 60 feet or less above ground. As a clarifying point, only Rule 250C specifies when extreme wind loading is required, not Figure 250-2(d), which is the NESC provision referenced in F.A.C. 25-6.0342. Figure 250-2(d) specifies three-second gust wind speeds for Florida, which are then referenced in Rule 250C.

Q. How does the NESC take into account the effect of wind speeds on distribution poles in Florida?

A. Rule 250B and Table 250-1 require that in the light loading district, which includes Florida, nine pounds per square foot of wind pressure be applied to the design of all poles 60 feet or less in height. Nine pounds of pressure is equivalent to winds of up to 60 miles per hour. This standard thus takes into account the higher wind speeds expected to be experienced in Florida. By comparison, the NESC requires that four pounds per square foot of wind pressure be assumed in the medium and heavy loading districts north of Florida. Four pounds of pressure is equivalent to wind speeds of approximately 40 miles per hour.

Q. What is the history and purpose of the exemption for poles 60 feet or less in height?

A. The EWL standard always has been limited to poles exceeding 60 feet in height. When originally adopted in the 1977 NESC edition, the rule was worded only to apply to poles exceeding 60 feet. The language of the rule was modified in the 1984 NESC edition and a specific exemption was added for poles 60 feet or less in height. The rule currently states "If no portion of a structure or its supported facilities exceeds 60 feet above ground or

water level, the provisions of this rule are not required, except as specified in Rule 261A1c, 261A2e, or 261A3d." These three rules require that poles below 60 feet high be strong enough to withstand extreme wind loads applied to the structure alone, without conductors. This is not a problem for round wood or common concrete poles.

The NESC committee responsible for strengths and loadings of overhead electrical systems has considered on numerous occasions whether to apply EWL criteria to distribution lines 60 feet or less in height. In fact, during each of the last two code cycles, the NESC committee considered proposed changes that would have required application of EWL to distribution systems of any height. The utility industry resoundingly agreed in comments submitted to the committee that most distribution pole failures in extreme weather events are the result of secondary damage effects from trees and debris, not wind alone, and that the system would have failed even if designed to the significantly more expensive EWL criteria. Based largely on this feedback from the field, the NESC committee retained the EWL exemption for structures 60 feet and less in the 2007 Code.

Q. Do any of the other Florida IOUs that have filed storm hardening plans embrace the EWL standard as FPL has done?

A. No. No other utility is planning to take this approach. The other utilities have proposed taking a targeted approach that would allow the evaluation of the performance of "hardened" system components in future storms so that any improvements in system performance or degradation could be quantified so that a reliable cost/benefit analysis could be performed. Indeed, Progress Energy Florida ("PEF"), Gulf Power ("Gulf") and TECO all have stated that EWL is not the right standard for poles less than 60 feet tall. For example, TECO's Plan states, "Tampa Electric's experience continues to show that there is no substantial evidence that building distribution structures to extreme wind construction Grades will prevent damage from falling trees, tree limbs and flying debris

during major storm events." TECO 2007-2009 Storm Hardening Plan at 15. According to Gulf's witness, Edward J. Battaglia, in his filing in support of its storm hardening plan, Gulf decided not to adopt the NESC EWL standards for all of its existing overhead distribution facilities because it is not cost effective to do so, stating, "Gulf's experience is that wind-blown debris is the predominant cause of damage versus pure wind." Battaglia Test. at 15. Furthermore, Jason Cutliffe, on behalf of PEF explained "the EWL standard would have no appreciable benefit for PEF's distribution poles with respect to preventing wind-caused damage" and "other coastal utilities and utilities that experience tornados, [support] the fact that the EWL standard has no appreciable wind damage prevention benefit for their distribution poles." Cutliffe Test. at 6. Mr. Mickey Gunter, who serves as a member of NESC Subcommittee 4 (Overhead Lines-Clearances,) 7 (Underground lines) and the Interpretations committee, also filing testimony on behalf of PEF, stated, "I agree with the 217 others who supported the rejection of eliminating the 60 foot exemption and retaining it in the 2007 NESC edition because eliminating the 60 foot exemption would yield unnecessary costs without significantly improving or increasing safety." Gunter Test. at 7.

Q. In your opinion, does it make sense to apply EWL to poles less than 60 feet tall?

A. In general, no. However, there is consensus in Florida that the standard is appropriate for Interstate highway line crossings and pilot projects to research the possible advantages and disadvantages of EWL standards being applied to distribution lines less than 60 feet high. The common causes of hurricane related pole failures are falling trees, flying building debris, soft soil made worse by heavy rains, weak guy failure, rotten pole failure, and finally wind force on poles, lines and attachments. Another common cause of wood pole failures is cascading of solid (strong) poles because an adjacent pole breaks in high wind because of flying debris, rot or another defect.

I have included as Exhibit MTH-4 to my testimony an affidavit filed by Dr. Larry Slavin on behalf of Verizon in FPSC Dockets 060173-EU and 060172-EU. Dr. Slavin is the current Chairman of the NESC Subcommittee 5, responsible for issues relating to overhead lines strength and loading. Dr. Slavin served on the NESC subcommittee that considered and rejected adopting the EWL for distribution poles. As Dr. Slavin testified in those dockets, the application of EWL to distribution poles is not prudent or cost effective. Slavin Affidavit § 3.1. He also points out that its application may have the unintended consequences of increasing vehicular injuries and deaths resulting from cars hitting a greater number of heavier poles, increased storm restoration delay resulting from more pole failures and harder to replace poles, and creating a steep learning-curve for engineers not yet trained in these types of applications. *Id.* § 4.2. For example, Dr. Slavin explains that increasing the number of poles, such as FPL intends to do to build to EWL, can multiply the number that are knocked down by flying debris during high wind. *Id.* Dr. Slavin and I are also of like mind that EWL should be applied to distribution poles, if at all, on a limited "trial" or pilot project basis.

Q. Would application of EWL criteria address all of the wind speed issues FPL is seeking to remedy?

A. No. Tornados and micro bursts within hurricanes have winds in excess of "extreme wind design speeds" which can and frequently do break poles which meet extreme wind criteria. These extremely strong winds create much more costly damage to lines designed to EWL than lines designed to Grade B or C. Moreover, there is no evidence that EWL design will reduce service interruptions. In fact, there is a strong likelihood that building to EWL criteria will cause significant delays in repairing and restoring service in areas hit by tornados.

Q. How so?

A. FPL plans for building to EWL include shortening spans by setting poles more frequently, and replacing many round wood poles with square concrete IIIH poles. In addition to the points raised by Dr. Slavin, there is evidence to suggest that concrete poles will diminish wind load resistance for attached lines. For square cross-section poles the NESC requires the use of a 1.6 load factor for wind loads on the pole itself as compared to a 1.0 load factor for wind loads on a wood pole which is round. With increasing wind speed, more of the square pole's ultimate strength is consumed to resist wind load on the pole itself and less is available to resist wind load on the overhead wires and other equipment. What this means is that if a comparable square pole and a round pole are both designed to a specific wind speed, such as 105 mph (the lowest included in the FPL plan), the square pole will be more likely to fail than the round pole at wind speeds in excess of the design. In other words, if lines in areas of Florida designed to 105 mph or 130 mph winds actually saw winds of 145 mph, square poles would be expected to have higher failure rates than comparably designed round poles. After a storm event, the concrete pole industry cannot easily provide the large quantity of poles that may be required in a few days. In addition, the installation of the heavier concrete poles requires equipment with more lifting capacity than a standard power company line truck, so there could be a lack of adequate equipment to make timely repairs. *See* Comments of the North American Wood Pole Association filed in Docket 070301, filed June 20, 2007.

Q. Does FPL base its decision to adopt EWL for all construction on any statistically reliable data?

A. In support of its decision to expand greatly the use of EWL, FPL relies heavily on "extensive analyses that FPL conducted either directly, or with the aid of external resources, such as KEMA Incorporated," including forensic observations of how the system performed during Hurricane Wilma. Plan at 6 (referring to Technical Report: Post

Hurricane Wilma Engineering Analysis, KEMA Final Report for FP&L, Project No. 05-349 (Jan. 12, 2006)) ("KEMA Report"); Miranda Test. at 16-17. Based on that analysis it concludes that the root cause of pole breakage was wind in Hurricane Wilma, and that FPL's transmission poles built to extreme wind loading, performed well overall. Plan at 12. Mr. Miranda, in his testimony, also relies on the KEMA Report to estimate the improved resilience of hardened distribution facilities. Miranda Test. at 17.

Q. Do you agree that the information reported by KEMA supports improved resilience of hardened distribution facilities?

A. No, not conclusively. The KEMA Report is a lengthy detailed report and analysis which contains several significant disclaimers and explanations of assumptions made. For example:

- At page 50 in Section 7.1, the KEMA Report states "Specific additions to this forensic study and data collection process together with improved accuracy in the pole population data would enable more specific and targeted engineering solutions."
- At page 58 in Section 7.2.5, the KEMA Report states: "FPL verbally confirms that assignment of root causes is a personal judgment call irrespective of the pole ownership."
- At page 77 in Section 7.4, the KEMA Report states "Design overload is not a major contributor to poles breaking during Hurricane Wilma. Focusing on the 53 FPL owned poles broken by the suspicion of design overload as a contributing factor, most of these were multiple breaks investigated by one inspector." Here KEMA is discrediting the "personal judgment call" of the "one inspector" that actually investigated those breaks.

- The "Forensic Data" the KEMA analysis is based on is questionable. The forensic data was gathered on mostly feeder poles while FPL has mostly lateral poles. KEMA concluded from the forensic data that 52% of the poles broken were by wind only. However, it also found that as much as 85% of the broken poles were "multiple failures" which is also known as cascading. One defective pole or guy wire can allow one pole to break and take down several solid poles which would not have fallen otherwise. Cascading can be started by trees or flying debris hitting facilities on one pole.
- At page 77 in Section 7.4, the KEMA Report states that "the counties and areas with highest pole failure rates coincide with the areas with highest wind speeds and are bordering ***open*** areas in the path of Hurricane Wilma." (emphasis added) This finding validates the well known fact that trees and buildings shelter lines from winds whereas open areas do not. This sheltering effect of course results in trees falling and flying debris as the wind force increases. The trees and flying debris can and do frequently break poles designed to EWL standards.
- At page 59 in Table 7-7, KEMA reports that 66% of feeder pole failures were mostly cascading failures and were caused by wind only. However, the "wind only" determination was based upon the personal judgment calls of the inspectors. A better forensic analysis would have sought to determine the cause or causes of the cascading failures which accounted for "85% of the recorded failures." The same Table 7-7 attributes only 12% of the lateral pole failures to wind only, 33% is attributed to tree and 47% to presence of deterioration. Lateral lines are the smaller lines which serve such areas as neighborhoods where more trees and

buildings are common. Significantly, 55% of FPL poles broken during Wilma were lateral poles.

- At page 68, the KEMA Report refers to a group of "wind only" failures where "half of them fell to the east and half of them fell to the west." That is consistent with an embedded tornado-type wind for which EWL would not likely provide adequate protection.
- At page 80, KEMA concludes, "Wind was the predominant root cause of pole breakage in general and tree breakage causing pole breakage in particular."

In sum, nothing in the KEMA Report suggests that EWL is justified for distribution poles in Florida; in fact, the KEMA Report concludes that FPL poles are not actually completely up to the Grade B standard. Osmose found a 5.63% defective pole rate in 2006 which failed to meet the Grade B strength required. The report also strongly establishes that pole breakage rates in Wilma were greatest in open areas where multiple breaks (cascading) were commonplace. I conclude that good maintenance of poles, guy wires and the right-of-way (i.e., trimming vegetation) together with additional storm guying, especially in open areas, is the best preventive strategy for cascading failures. Certainly more detailed forensic analysis of a better quality in the future would be very valuable.

Q. In his testimony, Mr. Miranda also relies upon an independent analysis prepared by Davies Consulting Inc. in February 2006 and states that the results of this analysis support the Company's decision to use EWL criteria for all new construction. Do you agree?

A. No. This study shows that stronger hurricanes generally result in more downed poles. There are far too many variables at issue however to conclude that EWL will decrease pole failures. For example, a significant percentage of outages were caused by falling

trees, rotten poles, cascading breaks, imbedded tornados, etc. It does not support a finding that building to EWL will result in fewer downed poles.

Q. In his testimony, Mr. Miranda states that two key conclusions drawn by FPL from its own 2004 and 2005 storms experience and forensic data form the basis for FPL's Plan: (1) wind was the predominant cause of distribution pole breakage in Hurricane Wilma; and (2) FPL's transmission structures, which are built to EWL criteria, performed well overall in Hurricane Wilma. He states that the failure rate for transmission structures was only .1% of FPL's system versus a failure rate of 1% for distribution. Do you have any thoughts about this?

A. Yes. First, the forensic data was gathered by FPL "inspectors." The determination of the cause of each broken pole was based on the personal judgment of the particular inspector. KEMA recommended, and FPL apparently agreed that the subjective nature of the inspectors' judgment as to the cause of individual pole failures was not fully reliable because the Report states that the quality of forensic data can and will be improved in future storms. KEMA Report at 50, 58; Table 7-8 legend at 60. While the root cause of most distribution pole failures was said to be wind, an even more fundamental question which should be answered is, "what are the common causes of cascading failures of solid distribution poles?" The conclusion that *wind only* caused most of the pole failures is questionable, as KEMA itself found that "wind was the predominant root cause of pole breakage in general *and tree breakage causing pole breakage in particular.*" KEMA Report at 80 (emphasis added).

Second, transmission lines are taller and frequently placed in wide right-of- ways. They therefore have much less tree and tree limb exposure. The very serious transmission structure failures which FPL did experience were cascading of multiple structures caused by defects on one or two structures. The cascading also involved one transmission line

falling on another one. Intervening in cascading failures of transmission lines and distribution lines should be a high priority.

Q. Do you think it is prudent, practical or cost effective for FPL or any other Florida utility ever to use EWL criteria for any poles 60 feet or less in height?

A. Yes. I believe it is prudent, practical and cost effective to use EWL criteria for limited pilot projects with wind speed measuring devices to enable the utilities to collect forensic data about the costs and benefits of building to this standard in Florida. I also believe that it would be prudent, practical and cost effective to apply EWL criteria to certain crossings that currently require Grade B construction as all four utilities have stated they plan to do.

Q. Why does it make sense to apply EWL to these crossings if the benefits are not yet known and are suspect?

A. These are the equivalent of limited pilot projects for critical infrastructure facilities. Interstate and Turnpike crossings by overhead distribution lines usually are important circuits for reliability of the power system, but more critically these highways are extremely important evacuation, emergency response and hurricane recovery routes. The most cost effective way to strengthen these crossings to EWL standards is storm guying where possible, which is what FPL plans to do. The crossings also seldom have tree exposure and if they do, the tree risk should be isolated or removed from the section of line which is storm guyed to EWL and crossing the thoroughfare.

The additional cost is prudent, practical and cost effective for these important highways and evacuation routes in Florida. Moreover, the effect of building crossings to EWL can be studied over time to determine the benefits.

Deployment Strategy

Q. Does the Plan adequately describe the Company's deployment strategy?

A. No.

Q. Please explain.

A. Rule 25-06.0342(4), F.A.C. regarding the deployment strategy is quite specific about the level of detail required in the storm hardening plans. The Rule requires each utility to explain the systematic approach it will follow to achieve the desired objectives. The deployment strategy details that must be included in each storm hardening plan are broken down into subsections (a) thru (e).

Q. With respect to subsection (a): Does the Plan include a description of the facilities affected, including technical design specifications, construction standards, and construction methodologies employed?

A. Yes. FPL has developed technical design specifications, "Design Guidelines" and a "Quick Reference Guide" which allow field engineers to more easily assess field conditions including pole strength requirements. The design guidelines also include some cable attachment specifications. FPL has done a very good job of developing these deployment details except for two crucially important aspects.

Q. What are those two critical considerations?

A. First, as I explained before, FPL applies EWL loading to its entire service territory. The overwhelming agreement among commentators in all four storm hardening plan dockets presently under consideration is that EWL standards for common distribution lines are not known to be practical, prudent or cost-effective. This is especially true in areas where trees and buildings are near the lines where flying debris causes the most damage during high winds regardless of the application of EWL construction.

The second deployment deficiency is that the guying effects of other power lines, communications cables and guy wires are not taken into account by FPL in calculating the strength of poles except for the application of storm guying.

Q. Why do you believe that FPL should not apply the EWL standard to distribution lines throughout its system?

A. There are many reasons which have already been discussed. The KEMA Report on forensic information gathered by FPL after Wilma noted in several places that severe damage involving cascading failures of poles was in open areas, in areas near the coast and in areas where trees caused poles to break. Rotten or deteriorated poles caused many failures and logically initiated cascading failures of other poles. If EWL is applied to more than pilot projects and Interstate crossings by FPL, the areas where it is applied should be justified on the basis of well described criteria including that they are located near the coast where the winds are normally the highest and in open areas where the lines are not sheltered from the direct effects of the wind. In addition, before changing out a pole with a stronger class wood pole or concrete pole, the guying effects of other lateral lines and guy wires on the poles should be taken into consideration.

Q. What do you mean by the guying effects of other lateral lines and guy wires on the poles?

A. Poles or any tower can be designed to be held upright by as few as three guy wires when nothing else is attached. A guy wire is a strong steel wire which is attached to a pole near the height on the pole where the pole needs additional support. The other end of the guy may be attached to a strong steel anchor in the ground or to another pole in the direction that the pull of the guy is needed. The requirements are that the guys and their anchors must have enough strength to overcome the horizontal force of wind on the structure. The structure must have enough strength to withstand the vertical load, if any, of the guys' downward component of pull on the tower. The horizontal component of the pull of the guys is what must equal or exceed the applied force of the wind.

Power lines near the top of the poles create the effect of having two sets of "guys" attached to the poles. These wires are much stronger than the tension at which they are

strung from pole to pole. The amount that the strength of each of these wires exceeds the pounds of tension on the wire is available to help strengthen the pole in that direction. This is the same effect on pole strength as guying. The lines are either straight through, turn an angle or stop on each pole. The straight line poles are called tangent structures, the angles are angle structures and the last ones are called dead end poles.

A tangent structure must have enough strength to withstand the force of the assumed speed of the wind for which it is designed. The wind direction must be assumed to be that which results in the most load on the pole. For a tangent pole with no other wires or guys attached the worst direction is perpendicular to the line because of the ability (guying effect) of the line to support the pole in two directions as stated above. The wind force is based on the exposed surface area of the structure and all of its attachments. This strength may be provided by the structure alone or other support such as guy wires and other electric wires and cables attached to the pole. These other attachments leave individual poles in various directions and at different heights. All of these attachments must have greater strength than the tension under which they operate. The operating tensions and strength of various wires and cables generally is known and the tension depends on the distance to the next pole. The amount that the strength of any attachment exceeds its operating tension produces a guying effect on the pole.

Angle poles are similar to a tower which is guyed three ways. The line provides guying effects in two directions and the third is provided by a guy and anchor, a horizontal guy wire to another pole or another line leaving the pole and acting as a guy. A dead end pole normally is strengthened in one direction by the power lines and by a guy wire or guy wires in the opposite direction. Dead end poles can be guyed if space is available by two guys whose anchors are spread apart enough to effectively storm guy the pole. The horizontal component of all of these guying effects can and often does make a common

diameter pole strong enough to meet EWL standards. Two photographs from the CIF projects at the Lake City Veterans Administration Hospital (Columbia County) and the Lee County Memorial Hospital (Fort Myers) attached as MTH-2, illustrate this point.

Q. Do you have an understanding of how FPL considers these guying effects on poles?

A. FPL states in its plan (and Mr. Miranda has confirmed orally) that "storm guying" is one of the first "tools" considered for use in designing to EWL standards by FPL. Mr. Miranda also has committed to evaluating the feasibility of adding a methodology into its engineering procedures to account for the *guying effects* of other lines, cables and guys on poles in its consideration of the strength of a given pole. However, my understanding of FPL's current practice is that it does not take into account guying effects of lateral lines, cables and guys on the pole, and I have not received any indication to date that FPL has reached a decision to change its current practice. As a result of FPL's failure to take into account the guying effect of lateral lines, cables and guys, many pole assemblies strong enough to meet EWL standards are being changed out unnecessarily by FPL at great expense. *See* MTH-2.

Q. With respect to subsections (b), (c), (d) and (e) of Rule 25-06.0342, F.A.C., does the Company's deployment strategy as set forth in the Plan satisfy the requirements of the Rule?

A. No. The Plan does not adequately describe the communities and areas within the service area where improvements are to be made. The Plan also fails to provide a detailed description of the extent to which joint use facilities are involved, an estimate of the costs and benefits to the utility including the effect on storm restoration and power outages, or an estimate of the costs and benefits to third party attachers.

The Plan has some detail for 2007 which has been supplemented. However, even for 2007 the Plan and supplements do not provide the level of detail required to enable third

party attachers to provide valuable input, which input FPL must seek, attempt in good faith to accommodate, and include as the basis for its assessment of the cost impact on third party attachers. Specifically, while the Plan provides a list of the CIF and interstate crossings affected in 2007, it does not include the necessary engineering details upon which cable operators can provide meaningful input. Engineering details of the CIF projects pertaining to power line work were provided for the remaining 2007 CIF projects in August, 2007. Much of the work had already been completed for the first engineering plans provided before the plans were delivered. As a result, third party attachers were not able to communicate concerns about these projects until it was too late. FPL also provided a list of CIF projects to be done in 2008 and 2009 in August, 2007. However, the information received to date still is inadequate to meet the requirements of the rule.

In addition, FPL's Plan does not provide sufficient details about its deployment of EWL for new construction, major planned work, relocations, daily work or incremental hardening. Further, the estimate of costs of hardening set forth in the Plan for 2007- 2009 ("approximately $40-70 million" for 2007, $75 to $125 million for 2008, and $100 to $150 million for 2009) and revised in Mr. Miranda's testimony based on actual expenditures in 2007 to date are far too wide-ranging to be useful. As set forth above, the perceived "benefits" of the Plan are entirely speculative. *See* Plan at 6 ("FPL's planning and budgeting process cannot provide equivalent detail at this time about deployment plans for 2008 and 2009.") and at 7 ("Of course, FPL's ability to identify and estimate benefits from storm hardening are necessarily incomplete and imprecise at this time.")

Moreover, FPL has not clearly stated what the impact will be on average make-ready costs or annual pole rents. Indeed, in response to FCTA Interrogatory No. 2, FPL states "FPL does not know the impact (or incremental cost difference) for make-ready that Storm Hardening will have on 3rd party attachers. However, make-ready costs are likely

to increase as a result of the construction set forth in FPL's Plan." FPL's Response to Florida Cable Telecommunications Association's First Set of Interrogatories, No. 2. FPL does state that the cost differential of a wood pole and EWL concrete pole could be as much as $8,000. FPL's Response to Florida Cable Telecommunications Association's First Set of Interrogatories, No. 5. FPL estimates that it will replace 2,100 poles in 2007 alone (70% of which are likely to be joint use poles) and that it will set 700 intermediate poles. FPL's Response to Florida Cable Telecommunications Association's First Set of Interrogatories, Nos. 8 and 9. So, the impact on cable operators potentially could be staggering but as of yet, there is no reliable information on which to base an assessment.

While FPL's Plan contains some useful detail about the CIF projects planned for 2007, the necessary detail is completely lacking for years 2008 and 2009, as required by the Rule. Indeed, according to FPL, "Details of this level for 2008 and 2009 are not available at this time." *Id.* Neither the Plan nor the supplemental disc provide any information about FPL's deployment plans for 2008 and 2009 concerning new construction, major planned work, relocations, or incremental hardening. Similarly, there is no information about the extent to which the electric infrastructure improvements planned for 2008 and 2009 involve joint use facilities on which third-party attachments exist. And, as stated above, the cost estimates for 2008 and 2009 are too vague and wide-ranging to be useful.

Q. Can you provide an assessment of the costs and benefits of the Company's Plan on third party attachers at this time?

A. The Company's Plan does not yet include enough information about the costs and benefits of its storm hardening plan to enable me to provide a specific estimate of the costs and benefits that the Company's plan will have on third party attachers. The Company's Plan provides cost estimates for 2007, 2008 and 2009 on a project annual basis. It would be

helpful to have more details about these costs including, if possible, an estimate of the incremental costs per mile and more details about the plant with third party attachments that will be impacted by these costs. The Company provided some additional cost information detail in its responses to discovery requests submitted in this Docket. I am currently analyzing this additional information and am not able to assess its usefulness at this time.

I can say that the costs that may be recovered from cable operators are tightly prescribed by the FCC. Under the federal scheme, FCTA members pay both make-ready costs—i.e., the cost of making the pole ready for its attachments (including the cost of rearranging existing facilities on the pole, guying the pole to increase strength, or replacing the pole where necessary)—and annual rent pursuant to the FCC's rate formula, which assures that pole owners receive the fully allocated costs of accommodating the attachment. The annual pole attachment rent is determined by multiplying the percentage of the total usable space occupied by the pole attachment by the sum of the operating expenses and actual capital costs of the utility attributable to the entire pole. In addition, depending upon the circumstances, cable operators may incur the cost of transferring their facilities to a new pole.

It is clear that cable operators will incur significant additional costs as a result of the Company's Plan. They will incur costs related to transferring their facilities to poles that are replaced due to storm hardening. In my experience transfer costs can be as little as $100 for a wood distribution pole but would be significantly more for transferring to a concrete or steel pole, and the costs quickly escalate to the tens of thousands where splicing or new cable runs are required. Annual pole rental rates will increase, possibly significantly. Costs attendant to making the pole ready for third party attachments—including the cost of pre-construction strength—will increase. The number of cable

operator attachments on which rents are paid will increase as additional poles are set in existing spans. Cable operators will incur higher costs as a result of constructing to Grade B or EWL. In addition, third party attachers likely will experience significant delays in provisioning service to customers as a result of the new processes and standards the Company is adopting in connection with storm hardening. Given the competitiveness in the communications service markets any delays likely will result in lost customers.

From the information I have seen thus far I do not see a corresponding benefit to third party attachers resulting from the majority of the storm hardening activities. As set forth above, I fear that building to EWL may actually increase storm related outages and recovery times. I also do not see a benefit from the Company's increased emphasis on the strength and loading impact of third party attachments. I strongly believe that limited pilot projects are necessary to better inform the cost benefit analysis. I also believe that more detailed information about the specific design and construction criteria that will be used, and the specific joint use poles that will be impacted, will better enable third party attachers to assess the costs and benefits to their operations.

Q. Is the Company's deployment strategy prudent, practical and cost-effective?

A. From the information that is provided by FPL and from what I have observed personally, I cannot conclude that FPL's deployment strategy is prudent, practical or cost-effective. The FPL plan proposes to harden the distribution system on a massive system wide scale by increasing the number of structures per mile and/or increasing the individual pole strength, for example, by replacing sound wood poles with a mix of larger wood and concrete poles and adding many more poles between existing poles. By ignoring the beneficial guying effects of other power lines, guys and cables on the poles which FPL evaluates for EWL projects as stated above, FPL's deployment strategy is not prudent, practical, or cost effective for EWL projects which may be approved by the Commission.

FPL does not target its EWL plans to areas near the coast or in open areas where lines are not sheltered from direct wind effects. EWL construction is completely inappropriate where large trees near enough to fall on the line exceed the height of the line and the negative effects of more and higher cost poles are likely to outweigh the benefits.

Q. Do you know of a power industry definition for "near lines or open areas"?

A. No. The NESC generally does not define common language terms. Such terms are expected to be defined by reference to normal dictionary meanings. Moreover, the NESC exemption from EWL criteria for poles 60 feet or less in height is based in part upon the fact that shorter poles are more protected (than taller poles) by trees up to wind speeds greater than 60 miles per hour at which point they are more susceptible (than taller poles) to damage caused by falling trees. The poles for which the NESC applies EWL criteria, poles taller than 60 feet, are typically taller than the trees. In contrast to the approach specified by the NESC, FPL proposes to apply EWL standards to its entire territory so FPL should provide guidance to its engineers with respect to trees near the lines and what open areas are. If FPL does not, many of the stronger and more numerous poles installed under FPL's plan will be broken by large trees towering above many of the lines being hardened to EWL when those trees are blown over by the very wind for which the hardened line was designed. Two photographs from the CIF projects at the Lake City Veterans Administration Hospital (Columbia County) and the Lee County Memorial Hospital (Fort Myers) attached as MTH-3, illustrate this point. These pictures are examples of instances in which FPL set new EWL hardened poles near large trees, and in one case, where such trees are actually towering above the line.

Q. Earlier you stated that FPL's plan actually may impact adversely the ability of FPL's distribution system to withstand extreme weather and hinder storm restoration. Can you explain what you consider to be some of these possible adverse effects?

A. Yes. One of the most certain is the one just discussed where more poles and more costly poles are added under or near tall tree canopies. FPL is also using large class wood poles and concrete poles which will be needed in large numbers after another major hurricane impacts FPL territory. To avoid extreme delays in restoration FPL will have to stock large quantities of these poles which are not traditionally available from most pole vendors' inventory. Normal emergency response crews that rush to Florida from all across the country are not capable of setting concrete poles. Special heavy lifting equipment must be used or, as is more likely, many wood poles will be temporarily used at great extra expense when the temporary wood poles later are replaced again by concrete. The traffic safety issue was addressed by Dr. Slavin as well as the fact that more severe weather such as tornados can break even the stronger and more numerous poles built to EWL creating more hazards for motorists and more cost to replace the poles. FPL has neglected to emphasize some of the common system improvements mentioned above to improve resilience and speed up restoration short of using EWL. The extremely high cost of FPL's total plan, which includes many speculative benefits and has significant negative effects not addressed in the plan, will have a negative effect for rate payers and third party attachers..

Q. Are there alternatives to building to EWL that strengthen power lines and improve their resilience to storm winds and reduce storm restoration expenses?

A. Yes. There are many proven distribution power system initiatives and storm recovery preparations other than replacing poles and building to standards that exceed the NESC that can produce greatly increased electric service reliability, decreased storm damage, and reduced restoration time and expense. For example, according to the FPL Reliability Report filed with the Commission on March 1, 2007, of the 96,000 FPL poles that were inspected, 3.5 percent did not meet Grade C Strength and 9 percent were non-compliant

with Grade B Standards. This suggests that rather than building to extreme wind design criteria on such a grand scale, FPL should focus on strengthening these poles which do not conform to its reported Grade B construction standard for distribution poles. Ensuring that poles are not rotten or otherwise defective should significantly assist in efforts to prevent storm outages and in storm restoration. Rotten poles in particular are a serious problem in high wind situations because they can cause a cascading effect, which breaks several adjacent sound poles.

In addition, many other proven distribution power system initiatives and storm recovery preparations can produce greatly increased electric service reliability, decreased storm damage, and reduced restoration time and expense. Storm hardening initiatives for overhead electric power distribution lines which are prudent, practical and cost effective should include:

- Small conductor replacement projects to decrease line breakage during storms. Indeed, many more outages in hurricanes involve broken wires than broken poles, especially in the impacted areas outside the central path of strong storms. These projects should be coordinated with pole inspections and vegetation management and include major maintenance and guying improvements.
- Right of way access improvement projects for lines which are inaccessible due to ditches, fences, small roadways, etc., including removing or providing access across such strategic obstacles to line sections. This will allow repair crews to access lines much more quickly during emergencies.
- The use of specialized equipment and or contractors for work in difficult right of way conditions such as back lot line, off road or swampy area lines for more efficient restoration.

- Pole inspection with strengthening or replacement or guying of deteriorated or overloaded poles. All deteriorated, broken or missing guys should be replaced. All buried anchor heads should be extended to above grade or water levels to prevent guy wires from rusting off.
- Installation of storm guying projects for line segments where it is feasible, including lines where poles are subject to lean over in soft soil during high winds. Larger poles do little to solve the problem of leaning in soft soil without guying.
- Adding line segment sectionalizing switches, breakers and fuses as needed to isolate sections of line which sustain heavy storm damage. This can greatly improve time to restore power to lightly damaged main line segments before all major storm damage in an area is repaired.
- Updating automatic electric primary circuit coordination of breakers and line sectionalizing fuses, and adding devices as appropriate to assure automatic line sectionalizing initially and facilitate power restoration after storms pass.
- Converting selected distribution systems' voltage from 12 or 13 kV to 25 kV. Four times the electric power can be delivered by the same circuit if the voltage is doubled. Higher distribution voltage decreases the need for larger primary wire sizes and multiple circuits as electric system load grows. The long-term effect on wind loading is positive, and there are many other economic benefits of 25 kV systems.
- Developing an improved procedure to avoid cutting of fiber optic cables by debris clearing and electric repair crews. In many instances fiber optic circuits have survived the hurricanes, still functional, but on the ground in places only to be cut repeatedly by others' restoration efforts.

Third Party Attachment Standards And Procedures

Q. Does the Company maintain standards and procedures for attachments by others that meet or exceed the NESC?

A. Yes. FPL's attachment standards and procedures for third party attachments included in its Plan require compliance with the provisions of the NESC that are relevant to this proceeding, which, as I have stated above, are Sections 24-26 relating to strength and loading requirements including the effect of wind on the poles and attachments. *See e.g.*, Plan Addendum, FPL Attachment Standards and Procedures, at 4, 6, 7, ("It is the responsibility of the attacher to ensure that attachments are designed and constructed in accordance with the National Electrical Safety Code."), 10, and 15.

Q. Do the third party attachment standards and procedures included in the Company's Plan assure as far as reasonably practicable that third party attachments don't impair electric service reliability or overload the pole, and are constructed, maintained and operated in accordance with generally accepted engineering practices for the IOU's service territory?

A. No.

Q. Why not?

A. First, FPL includes in its Plan submitted to the FPSC for approval certain terms and conditions governing third party attachments that are not related to the Commission's overall objective of enhancing electric reliability or reducing restoration costs i.e., storm hardening, and thus are beyond the scope of this proceeding and should not be approved by this Commission. Only standards and procedures that concern the loading impact of third party attachments on the strength of poles relate to storm hardening and should be in

the plans. Second, some of the attachment standards and procedures that arguably relate to storm hardening are not *reasonably practicable* as required by the Rule.

Q. Please explain which terms and conditions governing third party attachments included in FPL's Plan are not related to the overall storm hardening objective.

A. FPL includes requirements for attachment clearances in Section II.B. (pp. 7-8) of the FPL Attachment Standards and Procedures but these clearance requirements do not relate to storm hardening. Similarly, Sections III.B., III.C. and III.D. of the FPL Attachment Standards and Procedures all contain specific attachment process provisions, including application and permitting requirements and costs. These should not be included or approved by the Commission. As set forth above, the relevant provisions of the NESC are Sections 24-26 relating to strength and loading requirements including the effect of wind on the poles and attachments. Indeed, some of the provisions in FPL's attachment standards and procedures constitute rates, terms and conditions of attachment which are governed by pole attachment agreements between the parties and fall within the jurisdiction of another regulatory body, particularly the FCC, which under statute has exclusive authority to regulate the "rates, terms and conditions for pole attachments to provide that such rates, terms and conditions are just and reasonable" in non-certified states such as Florida.

Q. Which of FPL's attachment standards and procedures concern storm hardening?

A. Only those provisions pertaining to the loading effect of third party attachments on the pole are relevant to the concerns raised in this proceeding. The attachment standards relating to cable diameter, weight, installed tension and guying standards as well as identifying the poles affected are relevant.

Q. Are FPL's provisions pertaining to the loading effect of third party attachments *reasonably practicable*?

A. No. Although, FPL's approach to loading of third party attachments is the most reasonably practical approach being presented by the four IOUs presenting storm hardening plans at this time.

Q. Please explain your answer.

A. I agree with FPL's approach to considering the loading impact of new attachments. When a third party attacher seeks to attach a new cable to a pole, FPL allows third party attachers to work with its outside contractor, Alpine, to assess the load of the new "attachment." According to the guidelines developed by Alpine, "The wind loading portion of an attachment permit does not need to be excessively burdensome. The goal of the wind load calculations is to know that all the poles have sufficient strength for the proposed attachments. One way to prove that all poles have adequate strength is to include a calculation sheet for each pole. ***Another way is to use one calculation sheet to show that a number of poles with similar characteristics meet the wind loading requirements.***" FPL Permit Application Process Manual at 28 (emphasis added). In other words, FPL is saying that the analysis can be performed on the worst case pole in a given string of poles having similar characteristics. It is my understanding that this is what is typically done by Alpine in the field. This is acceptable engineering practice.

However, I do not agree with other aspects of FPL's strength and loading requirements for overlashing.

Q. Please explain what is meant by "overlashing."

A. What a cable operator initially attaches to the pole (i.e., a "new attachment") is not usually the coaxial or fiber conductor itself, but a steel wire support strand attached to the pole with a clamp and through bolt. The operator then places communications conductors parallel to the strand and secures them by wrapping the strand and the conductor(s) with a thin steel filament called a lashing wire applied by a lashing machine. The cables are not

wrapped around the support strand. Through the life of the plant, the cable operator may alter that plant, including by *lashing* additional conductors to the existing strand, i.e., overlashing. For example, growing neighborhoods may be served by lashing additional or rerouted trunk cables to the existing strand, using another filament lashing the new line to the existing strand. More often, in today's applications, fiber optic sheath is "overlashed" to the coaxial cables in order to increase bandwidth and to provide capacity to offer new services. In addition, operators use overlashing in emergency situations to repair customer outages. Overlashing is used to eliminate amplifiers (which are potential points of failure); to expand channel capacity; and to provide capacity for additional services.

Overlashing does not use more pole space, because the same strand remains attached to the same licensed position on the pole. Indeed, it is common for more than one cable to be held in place by lashing it to an already existing and already licensed strand or messenger.

Q. What aspects of FPL's Plan that relate to overlashing are not reasonably practicable?

A. FPL's Plan states that permitting is required for overlashing where the resulting bundle is heavier than the existing attachment or has an increased diameter over that of the existing attachment. Plan Addendum, FPL Third Party Attachment Standards and Procedures, p. 5. In my experience, this is not reasonably practicable.

Q. Why not?

A. In my experience third party attachments do not significantly increase the load on poles, and overlashing has only a very small incremental effect on the already attached strand and cable assembly. Rather, power lines, hardware for attaching lines to poles and power apparatus such as transformers, fused switches, lightning arrester assemblies, outdoor lights and many other power company attachments usually account for most of the wind

load on a pole because they have a larger cross sectional area and are attached to the top part of poles.

Wind load is a product of the surface area exposed to the wind multiplied times the force of the assumed wind and also multiplied times the pole height from the fixed point (often the ground line or the lowest guy wire) on the pole. As stated above, today's overlashing typically is of fiber optic sheath—a very light weight material that is quite small in diameter. A common fiber optic cable is .59" diameter and weighs .05 pounds per foot. It is telling that FPL produced no information in response to FCTA's discovery requests for information related to pole failures caused by overlashing. *See* FPL's Response to Florida Cable Telecommunications Association's First Set of Interrogatories, No. 20.

Q. You said above that there are certain aspects of FPL's requirements for overlashing that *are* reasonably practicable. Please explain.

A. My understanding is that even though FPL's Plan states that permits are required for overlashing, FPL's actual practice is more of a notification process and not "prior approval." This is significant because it is my understanding that "approval" or "permitting" is a term and condition of attachment that is regulated by the FCC and that the FCC has ruled that it is not reasonable for pole owners to require permitting for overlashing or even to require prior approval after a 30 day notice period because this unreasonably delays the provisioning of important services. I also find reasonable the fact that FPL does not require approval or notice for overlashing that does not result in added weight or increased bundle size. If there is no increased size or weight—for example, where a cable operator replaces existing conductors or equipment with fiber sheath—no notice should be required. FPL agrees. In addition, FPL allows cable operators or third parties hired by cable operators to assess the loading impact of overlashing on the pole,

and the loading impact can be assessed on a worst case pole for poles with similar characteristics. In these respects, FPL's practices concerning overlashing are reasonable and much more so than the storm hardening plans being submitted by other utilities.

Q. What do you propose as a prudent, practical and cost effective solution for overlashing?

A. I recommend that cable operators be permitted to overlash existing strand provided that they assess the loading impact on the pole within 30 days of overlashing. To the extent that the loading analysis demonstrates that the overlashing brings the pole out of compliance (or, as is more likely to be the case when poles are found to be overloaded, that the pole was already out of compliance) the operator should notify the pole owner, and make-ready should be planned.

Q. Is this ever done?

A. Yes, all the time. In fact, other Florida utilities, including TECO, have been doing this in practice for years. Other Florida utilities have not performed any loading analysis on the poles caused by overlashing. Tellingly, of the four utilities that filed storm hardening plans on May 7, 2007, not one has pointed to a single instance in which overlashing has caused a pole failure.

Q. Are you suggesting that overlashing should be permitted to bring a pole out of compliance?

A. No. First, it is highly unlikely that the incremental wind load caused by overlashing will bring the pole out of compliance. The strand-supported coaxial cable that typically comprises the initial attachment is itself one of the attachments that contributes the least to the wind loading of the pole. The wind load is determined by the diameter and length of wires and cables attached to poles as well as the diameter of the pole and the area of equipment on the pole. The area of each attachment is multiplied times the wind force and its attachment height. The wind load is expressed in foot pounds which causes a

mechanical "moment" on the pole at the ground line. The final step in the calculation is to multiply the wind load on each attachment times the height of the attachment above ground i.e., the moment arm.

Coaxial cables, used by cable television companies, are smaller and lighter than the common multi-conductor copper communications cables used by telecommunications carriers. Moreover, initial attachment of strand-supported cable plant is handled through the application and makeready process where the pole strength is evaluated and determined to be adequate. Even lighter than coaxial cables, however, are the fiber optic conductors which are most commonly used for cable television construction today. Indeed, .59-inch fiber optic conductors weigh only 50 pounds per 1000 feet.

In contrast, there are typically three power wires attached to the top of poles (primary voltage wires) with the neutral and secondary wires a few feet below the primaries but at least 40 inches above the highest communication cable. These wires frequently weigh more than coaxial cable. Power equipment mounted on poles above communications cables also adds wind load as well as the surface area of the pole itself. All of the power lines and equipment wind loads have to be multiplied times the longer moment arm determined by their higher attachment points above ground.

For all of these reasons and more, the loading effect of cable plant is often treated as insignificant in utility practice. The loading effect of overlashing is even less significant. In my experience, I have found no instance in which overlashed fiber was the "straw that broke the camel's back" by pushing an otherwise compliant pole into violation of applicable loading criteria.

Second, any slight non-compliance that might possibly be caused by overlashing could be quickly remedied. Attachers would be required to notify the pole owner within 30 days of overlashing and/or would assess the loading on the poles themselves.

Q. In your experience does the relative placement of cable operators' strand and overlash in the communications space on the poles have any beneficial effect on the stability of the pole or ability to withstand wind and other forces?

A. Yes it can.

Q. Would you please explain?

A. Cable plant is deployed similar to power and telephone plant on pole lines. However, due to the needs of each utility the cable television lines often turn or "pull off" the power pole at locations where the power lines do not turn. This pull off must be guyed unless it pulls off in two opposite directions as at some street crossings. These pull off cable lines with their steel messenger wires provide guying effects on the affected poles which strengthen the pole substantially because the pole is supported at 18 to 22 feet high. It is the same effect as storm guying. This helps keep the poles in a run stable and minimizes cascading as the strand helps keep the lateral poles from pulling down adjacent poles, thus keeping the circuits intact and causing fewer outages, unless of course there is a tree collapse, in which event it is likely no design feature could keep the facilities from being damaged. *See* MTH–2.

Q. Is your suggested approach consistent with the NESC?

A. Yes. The NESC is a performance standard. The NESC rules provide for what is to be accomplished. The utilities covered by the NESC, including power and communications companies, all have practicable industry practices and reasonable engineering guidelines available to assure compliance with the rules. An exhaustive engineering loading analysis on every pole is not necessary or practicable every time a communication or power attachment is added or modified on a pole. Indeed, given the delays and expense associated with a full engineering loading analysis for overlashing, and the likelihood that

the overlash will not be a factor contributing to any overload, any such requirement would not be cost-effective, prudent or practical.

Q. Is this consistent with generally accepted engineering practices for the utility's service territory?

A. Yes. Several Florida pole owners and pole owners throughout the southeast allow cable operators to overlash existing strand and notify the pole owner after the fact. Moreover, this is similar to what FPL itself allows for drop poles. It is common practice throughout the industry to allow cable operators to notify pole owners after the fact that they have attached to a "drop" pole—i.e., an oftentimes shorter pole used to carry a few service lines to a residence or business.

Q. You have said that the loading impact of most overlashing is *de minimis*. Are there situations in which overlashing could significantly increase the weight or bundle size of the existing attachment?

A. Yes. There are situations where overlashing could increase the weight or bundle size in a meaningful way such as when the resulting bundle size is significantly increased.

Q. Do you think that even overlashing resulting in significantly increased size bundles should be allowed without prior notice?

A. At a minimum, I think there should be some incremental load for overlashing that does not require a full blown loading analysis. New York takes this approach, for example. For incremental loads caused by overlashing existing strand that exceed an agreed upon threshold, I believe that a loading analysis can be performed by the attaching entity with the results provided to the pole owner.

Q. What do you think should form the basis of an "agreed upon threshold?"

A. The rule adopted by the New York PSC provides that "a predetermined limited amount of overlashing, that is not a substantial increase to existing facilities, shall be allowed,"

without notification and allows the attacher itself to make the determination. Specifically, "[a]n Attacher, [sic] whose facility has a pre-existing NESC calculated span tension of no more than 1,750 lbs., shall be allowed to overlash a pre-determined maximum load of not more than 20% to the existing communications facility. Existing facilities with an NESC calculated span tension of less than 1,000 lbs. shall be allowed a pre-determined overlash of up to 40% of such pre-existing facilities." *Proceeding on Motion of the Commission Concerning Certain Pole Attachment Issues*, Order Adopting Policy Statement on Pole Attachment, 2004 N.Y.P.U.C. LEXIS 306, *30 (N.Y.P.U.C. rel. Aug. 6, 2004). If the attacher "determines that the addition of equipment and loading is greater than the pre-determined limits, further assessment of the overlashed facility for its impact on the overall pole loading is required to assure that the pole limits are not exceeded." *Id.* In those cases, the attacher would be required to "provide the pole Owner with a 'worst case' pole analysis from the area to be overlashed, to be sure that the additional facilities will not excessively burden the pole structures." *Id.*

Third Party Input

Q. In establishing its Plan did the Company seek input from and attempt in good faith to accommodate concerns raised by third party attachers?

A. Yes and no. The Company did seek input from third party attachers. It submitted its Plan to the attaching parties and asked for feedback. However, because of the limited information provided by the company in the Plan concerning the projects for 2008 and 2009, the incremental costs associated with storm hardening, the joint use poles that would be impacted and the specific design and construction criteria the Company would be using on joint use poles, third party attachers were unable to identify all of their concerns or to provide a cost/benefit assessment of the Plans on third party attachments.

The cable operators did provide specific feedback concerning the Company's attachment standards and procedures for third party attachments, and FPL did make some small changes based on this feedback. While the level of input that third party attachers have been able to provide to date does not meet the requirements of the rule, there is hope.

Q. Why is that?

A. FPL continues to provide updated information. As set forth above, FPL provided two discs in August with additional details about its projects for 2007, 2008 and 2009. In addition, FPL has stated that for its critical infrastructure facility and community storm hardening projects it will hold pre-design meetings with all attachers to facilitate and coordinate the best and most efficient method to harden the facilities. "During these meetings, FPL will discuss its preliminary plan allowing attacher's [sic] to provide input and offer alternatives. This should also provide attachers more time to plan for the upcoming construction." FPL's Response to Florida Cable Telecommunications Association's First Set of Interrogatories, No. 13. And for smaller and everyday projects, FPL has committed to providing attachers with advance notice and an opportunity to "contact FPL prior to work being initiated." *Id.* In addition, the pole owners and FCTA have agreed to a "Process to Engage Third Party Attachers" (MTH-5) that was developed by TECO. This Process is intended to provide a mechanism for giving the level of engineering detail necessary for parties to assess the economic impact of the plan and to provide input as to the specific methodologies being employed, as required by the Rule. This Process, combined with on-site meetings and prior notifications promised by FPL, should alleviate concerns about the level of required detail that currently is missing from the Plan and the ongoing need for third-party attachers' participation.

Q. Does that conclude your testimony?

A. Yes.

BY MR. SEIVER:

Q All right. Mr. Harrelson, now would you do your summary? Thank you.

A Thank you. Good morning, Madam Chairman and Commissioners.

FPL's plan will not meet the objectives of enhancing reliability, reducing restoration costs and outage times in a prudent, practical and cost-effective manner because the plan applies extreme wind loading Grade B to distribution poles and lines less than 60 feet high for critical infrastructure circuits, new construction, critical poles, interstate crossings and major rebuild projects, as well as some of the incremental hardening throughout FPL's entire service territory as opposed to applying EWL in only areas where it is likely to have maximum benefits with minimum negative consequences.

FPL's plan ignores or at least fails to incorporate the well-documented effects of open areas and areas near the coast versus areas with concentrations of trees that were described in the KEMA report and analysis of FPL's forensic data from Hurricane Katrina and Wilma in 2005.

FPL is required by the rule to determine where, when and how to apply EWL criteria for distribution poles and lines in a prudent, practical and cost-effective manner. The NESC does not require EWL to be applied to such poles and lines less than 60 feet high; therefore, the NESC does not prescribe any

guidance for such an application. FPL must decide if it should consider both the sheltering effects which trees and buildings provide for winds and the danger of wind-blown debris and falling limbs in trees associated with placing more poles and more costly poles such as FPL's plan utilizes in its EWL designs and placing those poles near trees and buildings.

Where and when the extreme winds hit, some of the tall trees near FPL's new EWL lines are sure to fall on the lines after being blown down by the very wind speed force for which the EWL lines were designed to withstand. FPL intends to spend almost $300 million on implementing EWL for distribution lines in its three-year plan. The cost of one EWL concrete pole can exceed the cost of one Grade B type wood pole by $8,000 per pole.

FPL estimates it will replace 2,100 Grade B poles in 2007 and add 700 new EWL designed poles between existing pole locations to shorten span lengths. These numbers will likely double in 2008 and 2009.

FPL has done a very large volume of good work to develop engineering guidelines for use by field personnel in application of its EWL standards and incremental hardening design plans; however, there are two major deficiencies. In addition to not considering trees and buildings near the lines, the engineering criteria did not consider the strengthening effects, which are called the guying effects, of angles in the

power lines which are guyed, junction poles in the power lines where cables and wires cross such as at intersections, and pull-offs from the power line which are supported by guy wires.

As a result, many poles which are actually strong enough to withstand extreme wind are still replaced by FPL at great additional cost and disruption to the public because of the cranes, bucket trucks and other equipment that handle the concrete poles, the equipment that is often used. FPL lists storm guying, which is placing guy wires and anchors on both sides of straight line power poles, as its first preference and tool in its engineering tool kit to accomplish EWL strength for existing poles. This is an excellent application, cost-effective. FPL has committed to determine if and how it can include the other guying effects of the other lines and cables I mentioned. FPL is also investigating ways to include the effects of buildings and trees near lines into its EWL design. I believe these can and should be accomplished.

Finally, I believe that EWL is justified in interstate power line crossings in Florida. The NESC requires Grade B, and that's because of the critical importance of the hurricane evacuation and recovery operations for these interstate highways. Pilot projects for EWL design with instrumentation for good future forensic information gathering and the aggressive application of storm guying because it is so effective and cost-effective are all prudent, practical and

cost-effective. However, such a grand scale of implementing extreme wind for distribution poles as is in FPL's plan is, in my opinion, not prudent, practical and cost-effective. Thank you.

CHAIRMAN EDGAR: Thank you.

MR. SEIVER: Thank you. If I neglected to move his testimony as modified into the record, I would like to do that at this time.

CHAIRMAN EDGAR: I believe we did, but we will note that for the record to make sure that the prefiled direct testimony with the previously noted lines stricken will be entered into the record as though read.

MR. SEIVER: Thank you, Madam Chair, and I tender the witness for cross-examination.

CHAIRMAN EDGAR: Thank you.

Mr. Butler.

MR. BUTLER: Thank you, Madam Chairman. At the outset, let me note that staff has identified and all of us have stipulated to the introduction of Mr. Harrelson's deposition transcript as part of the evidence in this proceeding, and there are quite a few questions in there. I commend that to your reading pleasure. But I'm going to try to keep my cross-examination brief and focused because I won't be rehashing all of the ground that is covered in the deposition transcript.

CROSS EXAMINATION

BY MR. BUTLER:

Q Mr. Harrelson, good morning.

A Good morning.

Q Have you ever been qualified or have you ever testified as an expert on wind loading issues?

A No, I don't believe I have.

(REPORTER'S NOTE: Commissioner Argenziano entered hearing room.)

Q Is it also true that you have never been qualified and have never testified as an expert on storm hardening issues?

A No, I have not.

Q Is it true that you've never been qualified or testified as an expert on forensic analysis of storm damage to a pole network?

A That's correct.

Q And just to clarify, before this proceeding have you ever testified on the subject of the appropriate way to storm harden electric distribution systems?

A Storm hardening beyond requirements of the National Electric Safety Code I have not. To my knowledge this is the first time this has come up is in Florida.

Q Have you ever conducted any formal forensic analyses of storm damage to electric utility distribution systems of the

sort that FPL performed in the 2005 storm season?

MR. SEIVER: I'll just object to that question on what the term "formal forensic analysis" means. If it's clear to the witness, that's fine. But I believe that "formal" is a vague term.

MR. BUTLER: I will withdraw the word "formal" from the question.

BY MR. BUTLER:

Q Do you recall the question or do I need to restate it?

CHAIRMAN EDGAR: Actually I would request that you restate the question. Thank you.

BY MR. BUTLER:

Q Have you ever performed forensic analysis of storm-related damage to electric distribution system facilities of the sort that FPL performed during the 2005 storm season?

A Not in exactly the same manner. I do have two years of experience with hurricanes in South Florida in 2004 and '05, and I took a lot of photographs and made some observations, but I did not present a written report or do a formal analysis. I also have a week or ten days experience in South Carolina with Hurricane Hugo.

Q But I believe you agreed in your deposition that this was kind of an after-the-fact forensic evaluation of what you saw as opposed to a system that was in place in advance to sort

of gather data specifically with respect to the cause of storm damage?

MR. SEIVER: I want to object to that. It's assuming some facts that I'm not sure are in evidence, but.

THE WITNESS: Yes, sir. I don't recall exactly what I said. But if I could restate my experience, I did the evaluation informally with photographs as it occurred, as I worked in the field. Then there was a review, but it was also not extensively documented. It was discussed after the fact.

BY MR. BUTLER:

Q Do you know of any entity other than FPL that has conducted the sort of forensic analysis of storm damage to electric distribution systems in Florida that FPL conducted following or during the 2005 storm season?

A No, sir, I don't.

Q Okay. Mr. Harrelson, is it true that FPL met with third-party attachers in April of 2007 to explain the Storm Hardening Plan that it was intending to file?

A Yes. And I believe I attended that meeting.

Q That was going to be my next question. Did you attend it?

A Yes.

Q Okay. Did you ask questions during that meeting of FPL?

A I did. Yes. Yes, sir, I did.

Q Okay. And did FPL respond to your questions?

A They did. At first the response was they had considered my concerns about the additional strength and guying effects of junction poles and angle poles and that they had determined that it was better to go ahead and put stronger poles in at that point in time.

Q But I think, as you described in your summary, over time FPL has had further discussions with you and has agreed to consider more formally those guying effects; is that correct?

A Yes, that's correct. I confirmed that in some rebuttal testimony. That's correct.

Q Okay. And is it also the case that FPL met specifically with the FCTA in August to further explain its Storm Hardening Plan?

A Yes.

Q And did you attend that meeting?

A I don't remember the dates, but I attended more than one meeting. I'm almost certain that I did attend that particular meeting.

Q Okay. And did you ask questions of FPL at that time?

A That's correct. Yes. That was a telephone and in person meeting, and I was in person and some others were on there by phone.

Q Okay. Has the FCTA received detailed engineering drawings for FPL's 2007 storm hardening projects?

A Yes.

Q Have you reviewed those?

A I have reviewed certain of those, and I've also reviewed, in not great detail but in some detail, two of the actual construction projects.

Q Okay. Has FPL accommodated any requests that you've made to participate in such meetings on the actual details of the projects?

A Not entirely, but I think within reason, yes.

Q Okay. Has the, has the FCTA also received CDs of FPL's route maps for the 2008/2009 projects?

A Yes, I'm sure we have. I was trying to remember any of the details. But there are, as you described, route maps which basically show the one line diagram, no poles in particular, but the street backgrounds in the one line diagrams where the circuits affected are located.

Q Do you have any reason to believe that FPL has not provided FCTA information on its hardening projects as that information has become available?

A No, I do not.

Q Do you believe that the process to engage third-party attachers which the Commission has approved provides a useful mechanism for dialogue between electric utilities and third-party attachers about the future projects?

A Yes, I believe that would be useful.

Q Uh-huh. And do you believe that FPL has dealt with the FCTA in good faith regarding the coordination of third-party attachments to its hardening projects?

A Yes, I do. The only thing I would like to add, it's been a little slower than I had hoped, but I think I understand.

Q Thank you. Mr. Harrelson, at your deposition you described some, I guess inspection may not be the proper word, but some visits you made or some observations you made of damage that was caused by Hurricane Charley. Do you remember that?

A Yes.

Q Okay. And am I correct that you observed damage from Hurricane Charley in, I think it was Arcadia and Lake Wales; is that right?

A I know I did. Whatever the towns on Highway 27, U.S. Highway 27. I believe that's Lake Wales. Sometimes I don't remember the names exactly right. But it was as I returned northward on Highway, U.S. 27 immediately after Hurricane Charley went through or shortly after Hurricane Charley went through.

Q And is it your understanding that Hurricane Charley entered Florida on the southwest coast and then headed sort of northeast or east/northeast across the state?

A That's correct. Landfall was at Punta Gorda.

Q So it would have hit the coast and then traveled inland before it did the damage you observed at Arcadia and Lake Wales; is that correct?

A That's correct.

Q Okay. And I think you agreed at your deposition that Arcadia is something more than 25 miles inland; is that right?

A I believe that's correct. It would be easy to verify.

Q And I think you also agreed that Lake Wales is something more than 50 miles inland; is that right?

A Yes.

Q Okay. Is it your understanding that FPL's Storm Hardening Plan has three separate wind zones that have different wind speeds to which the EWL hardening is designed in each respective zone?

A Yes, it does. And additionally I think that's very reasonable.

Q Okay. And do you happen to recall what the three wind speeds for those zones are?

A I believe it's 145, 130 and 105.

Q Okay. And would you agree that the wind speed, I mean, or the wind force to which poles would have to be designed in the 145-mile-per-hour zone is approximately twice as strong as the wind force in the 105-mile-per-hour zone?

A It is as required by the National Electrical Safety

Code for poles and attachments greater than 60 feet in height. So in general the answer is yes, but the code applies it to 60 feet and greater.

Q Okay. Now do you recall from FPL's wind zones, are the, the areas that are within the 145-mile-per-hour zone predominantly on the east and sort of lower southwestern coastal areas of Florida?

A That's correct.

Q Okay. And the area of the 105-mile-per-hour wind zone is pretty much in the north central part of FPL's service territory?

A Yes.

Q So the design of FPL's poles for EWL hardening purposes in this north central inland area would only have to withstand approximately half as much wind force as the poles designed for the coastal areas that are in the 145-mile-per-hour wind zone; correct?

A Yes, I think that's correct. And I know it's also been stated that Grade B is equivalent to different wind speeds by different people testifying, but roughly equivalent to 105 miles per hour or greater. So it's a puzzle why Grade B poles are changed out in places like Lake City where the applicable wind speed is 105.

Q During your observations of hurricane damage in the 2004 and 2005 hurricane season, I believe you've testified at

your deposition that you saw instances of cascading pole failures; is that right?

A Yes. Many of them.

Q Okay. And is it true that you saw some instances of cascading poles that it appeared those events were initiated by wind only, that there wasn't any evidence of debris or trees falling on the pole to initiate the cascade?

A That's correct. I'm sure I saw some instances of that. And I did certainly see some instances that were also initiated by deteriorated poles. I saw other instances were definitely initiated by either broken or weakened guy wires that pulled up and started the cascading event. And then another issue that I observed is very important: The poles that the cascading event stopped on was usually one of the guyed poles, angle poles or junction poles where there was additional strength to that particular pole by these other effects that FPL is now considering.

Q You anticipated my next question, but let me just clarify.

Is it your understanding that FPL's storm hardening design guidelines include the use of storm guys for, among other purposes, to shore up poles along line -- pole lines along -- along long pole lines to try to minimize the potential for cascading?

A I think I'm beginning to understand that better. I

don't think it was stressed in the plan so that I understood it from my first reading of the plan, but I agree.

Q I'd like you to turn, please, to Page 34 and 35 of your testimony.

A What's that stamp number on the page?

Q I'm sorry?

A Could you tell me the stamp, Bate stamp number?

Q I don't know that it has a Bate stamp number.

A Okay. I can find it. I can find it.

Q It's your prefiled testimony Page 34. It says 34 at the bottom of it.

A What line?

Q I'm sorry?

A What line on 34?

Q Well, I'm getting there. I just -- right now just get to Page 34. Do you have it in front of you?

A I think I do.

MR. SEIVER: Mr. Harrelson, it's your testimony, not the deposition.

THE WITNESS: I think I don't.

BY MR. BUTLER:

Q This should start with the words "With Grade B standards" at the very top of the page.

A It does. Thank you.

Q You have a list of what you consider to be prudent,

practical and cost-effective measures to storm hardened systems that starts on Line 13 of Page 34. Do you see that?

A I do. Yes.

Q Okay. The first item here is small conductor replacement projects. Do you see that?

A I do.

Q Okay. Do you know whether FPL is conducting small -- an unfortunate choice of words -- is implementing small conductor replacement as part of its Storm Hardening Plan?

A I believe I do now. I know I've been informed of that recently. I do not think it was pointed out as part of their plan.

Q Do you know whether FPL -- excuse me. Do you know whether FPL is attempting to implement right-of-way access improvement projects where it has secured the right to do so, the legal right to do so?

A I don't, I don't know any details. I would think that they could if they chose to increase emphasis on that, whatever they're doing. But I'm just saying in general those are very effective practices and I don't know what FPL is actually doing.

Q From reviewing the rebuttal testimony of FPL's witnesses, do you know whether FPL is using specialized equipment and contractors for work in difficult right-of-way conditions, off-road or swampy areas?

A Yes, I do now, and I believe it's part of their recovery plan.

Q Turning to Page 35, continuing the list of bullet items, the next item is pole inspection. Do you know whether FPL has a sort of expanded or more aggressive pole inspection program as part of its overall hardening initiatives?

A I do observe from the reliability report that they're spending a very large increase on pole inspections and remediation. I'm not certain the details of their inspection, incorporation of inspections of the associated guy wires. If not, I think that's something they should consider.

Q Okay. Your next bullet refers to installation of storm guying, and I think we discussed this earlier. Is it true that your, your understanding is FPL's design guidelines for its storm hardening incorporates the use of storm guying?

A Yes, it does. I was, I think, trying to point out that I did not see, or alluding to the fact that I did not see it in the plan that they had identified special particular storm guying projects for existing lines in places such as swampy areas, soft soil, agricultural areas where the storm guying alone could be very effective in incremental hardening.

Q Your next two bullets deal with the subject of sectionalizing the electric system so it's possible basically to restore a portion of it while other portions are still damaged; is that correct?

A Yes. And, in fact, part of what FPL had included in its interstate highway crossing strategy reminded me that that's a very effective practice. So I knew they were doing it on their interstate highway crossing application. I just didn't see it in the plan about a wider application.

Q Okay. But based on FPL's rebuttal testimony, is it your understanding that FPL is actively pursuing the use of sectionalization where appropriate?

A Well, I know they're pursuing it, and I suppose where appropriate would be a matter of priorities and budgeting and engineering discretion.

Q But there is -- I agree that one can always debate how much is appropriate. But you would agree that FPL is actively pursuing that topic?

A Yes. Yes, I do.

Q Okay. The next item is bullet point starting on Line 15 about increasing distribution system voltage from 12 or 13 kV up to 25 kV. Do you see that?

A Yes.

Q And do you recall from your deposition our discussion of this topic? And I think I could characterize your answer accurately as saying that you thought this is something that would be applicable in sort of long-run lines in rural areas where there's a real opportunity to increase the power carrying capability of that line?

A Yes. That was one example. That's correct. And I read as well I think in some rebuttal testimony that certain parts of Florida Power & Light's distribution system is, in fact, operating at 25 kV rather than 13 or 12.

Q Would you agree that most of FPL's service territory is not in the sort of rural conditions where this particular measure would be applicable?

A Right. That's, that's the example I gave. But I do believe that it's in the testimony that the open areas that were affected first by Hurricane Wilma were 25 kV circuits or at least part of them were.

Q Okay. And the last bullet point is about improved procedures to avoid cutting of fiber-optic cables by debris clearing and electric repair crews. Do you see that?

A Yes.

Q And are you aware of instances where FPL's storm restoration activities resulted in cutting or otherwise damaging fiber-optic cables of FCTA members in a way that you feel could have been avoided?

A No, I'm not specifically, not with FPL and, and not specifically with anyone. But I have heard discussions of the fact that immediately after some of these severe storms they have a technique of checking their fiber-optic cables with a light and it's functional, and then in pursuing days unknown parties clearing roadways, clearing debris and in some cases

with bolt cutters cut those fiber-optic cables, perhaps not knowing the consequences or the cost to repair. So it's an issue that I think has great potential for our working together. I didn't mean to imply that FPL was negligent in that.

Q Thank you. One final topic I wanted to cover with you, Mr. Harrelson. Would you turn to your Exhibit MTH-4?

A I'm there, and it's a poor copy. Let me get a different book.

MS. FLEMING: If I may interject.

CHAIRMAN EDGAR: You may, because I think I have the same question.

MS. FLEMING: I believe Mr. Harrelson's exhibits have been renumbered because there were duplicate exhibits in different dockets, and I believe FCTA had an errata sheet of those exhibits. So, John, if you could be specific as to which -- if you're discussing --

MR. BUTLER: It's the Slavin affidavit, and if that's been renumbered --

THE WITNESS: Slavin. Okay.

MS. FLEMING: That would be MTH-2.

MR. BUTLER: It's 2 now?

MS. FLEMING: Yes.

THE WITNESS: In my copy. I'm there.

CHAIRMAN EDGAR: So, Mr. Butler, you were attempting

to draw our attention to the, what's labeled "Affidavit of Dr. Lawrence Slavin"?

MR. BUTLER: That's correct. One thing I would observe is that the package I have, unless they've been withdrawn, there is an MTH-2 and an MTH-3. They were pictures of power facilities. Are those now no longer exhibits?

THE WITNESS: They're exhibits but the number is different, I think.

MS. FLEMING: If I may interject. As we stated previously, an errata sheet, I believe, was provided to all parties by FCTA, as well as to all the Commissioners. Mr. Harrelson provided testimony, four separate sets of testimony in four dockets. The exhibits were duplicative. So in order to enter only one exhibit in each docket, we consolidated the exhibits and renumbered the exhibits so that it would flow better for purposes of the hearing. The correct identification of the exhibits is entailed in staff's Comprehensive Exhibit List. So to the extent that it's possible, if parties can refer to the exhibit as it's designated on the Comprehensive Exhibit List, that would be helpful.

CHAIRMAN EDGAR: Okay. And there again, we'll work, work through it together.

MR. BUTLER: Yeah. Okay. Then MTH-2 is what I'm referring to apparently. That's the affidavit of Dr. Slavin;

correct?

MS. FLEMING: Yes. That's correct.

CHAIRMAN EDGAR: It is. And that is, just for purposes of the record, labeled as Number 29 on the list.

MR. BUTLER: Thank you.

BY MR. BUTLER:

Q Mr. Harrelson, what is the date of the affidavit of Dr. Slavin that you've attached to your testimony?

A Can you help me find it?

Q Yes. I'm referring to the filing date. It's up in the style of the document above the title "Filed August 11, 2006." Do you see that?

A August 11th, 2006.

Q Yes. Okay. Would you agree that that date is well before FPL filed its Storm Hardening Plan in May 2007?

A Yes.

Q Okay. In fact, would you agree that Dr. Slavin's affidavit that you've attached to your testimony is actually directed at a rule proposal that was current at that time that would have required each utility to adopt, to the extent cost-effective, EWL hardening within its system?

A It was a rulemaking process. I'm not sure I could even understand it completely. But would you restate?

Q Well, let me go with what you just said. Do you know what the, the nature of the rulemaking process was for which

Mr. Slavin or Dr. Slavin's affidavit was originally submitted?

A It was my understanding that the Commission and staff was developing a rule to address the reliability and resilience of the electric distribution system in Florida during extreme weather events.

Q But you don't know the specifics of the rule to which Dr. Slavin's affidavit was addressed, the rule proposal?

A The proposed rule?

Q Right.

A I have copies of it but I can't quote it to you now. I was here when he made that presentation.

Q Do you know whether the rule was adopted as, as it was proposed, you know, at the time that Dr. Slavin filed this affidavit?

A It was not.

Q Okay. What role did you play in preparing Dr. Slavin's affidavit?

A None.

Q Are you personally a member of any NESC committee or subcommittee?

A No, I'm not.

MR. BUTLER: Okay. Thank you, Mr. Harrelson. That's all the questions that I have.

CHAIRMAN EDGAR: Mr. Wright.

MR. WRIGHT: Thank you, Madam Chairman. I have

limited cross-examination for Mr. Harrelson.

CHAIRMAN EDGAR: Okay.

CROSS EXAMINATION

BY MR. WRIGHT:

Q Good morning, Mr. Harrelson.

A Good morning.

Q Are you capable of testifying only about cable telecommunication -- cable television facilities, or if I were to ask you a question that says cable and telephone or cable and telecommunications facilities, would that throw you off?

A I'd have to hear the question, but I do have some experience in both those areas.

Q Thank you. As a preliminary matter, are you familiar with FPL's Storm Secure Plan?

A Only I'm aware of it that it was approved for early 2006.

Q Okay. As a general matter, will you agree that telecommunications and cable television facilities that are installed underground are less vulnerable to direct wind damage than overhead facilities?

MR. BUTLER: I'm going to object to this question as not relating to Mr. Harrelson's direct testimony.

MR. WRIGHT: He testifies about FPL's plan. FPL's plan includes undergrounding. I want to ask him about it.

MR. BUTLER: Well, he testifies about particular

things. He objects to the particular way that we're going to apply extreme wind loading to our overhead system. I don't think there is a single reference to under -- to FPL's plan as it relates to underground facilities, and so I really think this goes beyond the scope of Mr. Harrelson's direct testimony.

MR. WRIGHT: I'll move on.

BY MR. WRIGHT:

Q Mr. Harrelson, do I understand your testimony correctly in that it criticizes FPL's plan for adopting extreme wind loading criteria?

A Certain aspects of FPL's adoption and implementation of extreme wind loading criteria I do disagree with.

Q Well, for example, at Page 9 of your testimony you testify that the Commission should not find that FPL's plan meets the desired objectives of enhancing reliability and reducing restoration costs and outage times. Are you familiar with that part of your testimony?

A That's correct. Yes.

Q And again at Page 12 you testify that the company's plan does not meet the desired objectives of enhancing reliability and reducing restoration costs and outage times in a prudent, practical and cost-effective manner. Are you familiar with that part of your testimony?

A Yes, I am. That's correct. And my intention there is to state that the entire plan as it's stated should not be

approved.

Q And my question for you is have you performed any cost-effectiveness or benefit cost analysis of FPL's plan as it -- of FPL's plan?

A Nothing I would characterize as a cost analysis, no. But I'm not an economist either.

Q Well, and nothing coming within the scope of a benefit cost or cost-effectiveness analysis as you understand those terms; correct?

A Correct.

Q Thank you. At Page 31 of your testimony, Mr. Harrelson, you make this statement. "From the information I have seen thus far, I do not see a corresponding benefit to third-party attachers resulting from the majority of these storm hardening activities." Are you familiar with that part of your testimony?

A Yes.

Q Okay. Now my question for you is -- well, a couple of preliminary questions.

Have you made any study of storm restoration cost savings that might be realized through FPL's storm hardening activities as set forth in its plan with regard to cable television or telecommunications facilities?

A No.

Q Have you made any study of any other benefits; for

example, reduced lost revenues as a possible benefit from storm hardening as set forth in FPL's plan?

A No studies, no.

Q Okay. So would it be a fair characterization of your testimony that you testify FPL hasn't demonstrated cost-effectiveness to your satisfaction, but you haven't done any analysis of cost-effectiveness either?

A I'm sorry. I might not have been paying attention. I didn't follow you.

Q I'm sorry. That was a little longer than I try to make my questions.

You testified you don't believe that FPL's Storm Hardening Plan is cost-effective.

A That's correct.

Q Okay. But you haven't done any analysis to show whether it is or not; correct?

A I would not characterize my observations based on my experience and based on a review of their plan as an analysis. It is my professional opinion.

Q But you haven't made, you haven't made any estimate of the benefits to cable telecommunications providers or cable television providers or telecommunications service providers from storm hardening as per FPL's plan, have you?

A It's my opinion -- the answer is no. And it's my opinion that there's not sufficient information to do a

detailed analysis. And I'm not certain I'd be the best person to do an economic analysis, but it is my opinion that there's not enough information there to make that analysis.

MR. WRIGHT: Thank you. That's all I have.

CHAIRMAN EDGAR: Thank you. Are there questions on cross from any of the other parties? I'm seeing the answer as no. Are there questions, are there questions from staff?

MR. TEITZMAN: Staff has no questions for the witness.

CHAIRMAN EDGAR: Okay. Thank you. Are there questions on redirect?

MR. SEIVER: Just a few, Madam Chair. Thank you.

CHAIRMAN EDGAR: Okay.

REDIRECT EXAMINATION

BY MR. SEIVER:

Q Mr. Harrelson, you might recall that Mr. Butler had asked you about the 2007 engineering and the projects. Do you recall that line of questioning?

A Yes, I do.

Q And I think you said you had actually looked at, you had looked at two actual construction projects?

A I have. Yes.

Q And which two are those?

A It was one in Lake City to upgrade the circuits to the Veterans Memorial Hospital in Lake City to EWL, and I

believe it also included the Shands Hospital on the north side of town and a large sewage plant on the south side of the veterans hospital. So there were actually three perhaps critical infrastructures involved in that upgrade. I looked at that and took photographs and also put together a PowerPoint presentation of my observations of that partially completed project. FPL had completed its pole work. The cable, telephone and TV and whatever other third-party attachments had not yet been transferred.

Q And had you come to any conclusions about that project after viewing it?

A There were a number of concrete poles installed in Lake City, there was a large number of poles that had strengthening guying effects that I believe could have been taken into consideration and in a few instances were taken into consideration, and there was a lot of poles changed out. Lake City, of course, has a lot of tall pine trees similar to Tallahassee, a lot of large oak trees, and I believe that if a 105-mile-an-hour wind comes through Lake City, a lot of that work there will be torn down by those large trees falling into those lines.

Q Mr. Harrelson, did you include photographs and a discussion of what you saw at Lake City in your testimony?

A I do. I have two photographs.

Q And did you look at another project? Did you say

there was a second project?

A Yes. When I was traveling to the meeting in Miami, I stopped at a project in Fort Myers. It was an EWL upgrade of the circuit to, I believe, the Lee County Memorial or -- I don't recall exactly the name of the hospital, but it was in Fort Myers. And I observed and photographed a very large number of concrete poles that had been installed on that job; some concrete poles replacing other concrete poles which were not designed to the strength level that was, was used to replace them.

Q And did you come to any conclusions about that project after you viewed it?

MR. BUTLER: I'm going to object to this line of questioning. I don't think that it's redirect of anything I asked about. My question to Mr. Harrelson was really confirming that he had received and had an opportunity to look at data, you know, going to the subject of the cooperation, the degree of exchange of information between FPL and the cable industry. This is not addressing that subject at all. It's just using it as a pretext to get Mr. Harrelson into the subject of opining about specific facilities that he reviewed.

MR. SEIVER: I'll withdraw the question and substitute another.

BY MR. SEIVER:

Q Mr. Harrelson, did you discuss the Lee County/Fort

Myers project in your testimony?

A To some extent I did, yes.

MR. SEIVER: That's all I have. Madam Chair. Thank you.

CHAIRMAN EDGAR: Thank you. Let's take up exhibits.

MR. SEIVER: We were going to -- if we could have indulgence for a moment because we were going to move to TECO.

MS. FLEMING: Madam Chairman, if I may, I would suggest that FCTA identify the errata sheet regarding the exhibits as a hearing ID, please, and I have it as Exhibit Number 52. I don't know if copies have been handed out to all the parties or the Commissioners.

CHAIRMAN EDGAR: Of the errata sheet?

MS. FLEMING: Of the errata sheet regarding the change of testimony exhibits.

CHAIRMAN EDGAR: Okay. Commissioners, okay, I believe the errata sheet was passed out here at the bench yesterday. We did not, at least during the time I was here we did not identify it, and I don't readily see it on the exhibit list in front of me. So unless I am corrected that we did, we can go ahead and mark that as 52, the errata sheet as Exhibit 52. And if there are parties that need copies, I'm sure that we can accommodate that.

MR. SEIVER: Thank you, Madam Chair. Yes, it was not marked, so --

CHAIRMAN EDGAR: Okay. We will label it as 52, and the heading is Errata to the Testimony of Michael T. Harrelson filed October 2nd, 2007.

MR. SEIVER: And I would ask then that we move that into the dockets in which Mr. Harrelson has his direct testimony, which are the Tampa Electric docket, the Gulf Power docket -- I'm sorry, the Progress docket and the Florida Power & Light dockets.

CHAIRMAN EDGAR: I'm sorry. Could you say that for me one more time?

MR. SEIVER: I would ask that the errata sheet, hearing Exhibit 52, be moved into the record in Docket 070297 with regard to Tampa Electric Company, into Docket 070298 with respect to Progress Energy, and Docket 070301 with respect to Florida Power & Light.

CHAIRMAN EDGAR: Okay. Okay. I'm with you now. Thank you.

(Exhibit 52 marked for identification and admitted into the record.)

Mr. Willis, how would you like to proceed with your cross regarding the 297 docket?

MR. WILLIS: What I'd like to do is take a short break so I could confer with FCTA, Madam Chairman.

CHAIRMAN EDGAR: Okay. Let's --

MR. BUTLER: Madam Chairman, before we take a break,

did I miss it? Did FCTA move into the record the exhibits of Mr. Harrelson other than that errata sheet?

CHAIRMAN EDGAR: We have not moved the exhibits yet.

MR. BUTLER: And we're going to do that at the end of all of the cross-examination.

CHAIRMAN EDGAR: We are. I got a little ahead of myself. I apologize. Never forgetting but needing to come back to Mr. Willis and TECO to see how we want to proceed with that. So, no, we have not yet entered the exhibits and we will take that up collectively. So let's take -- let's come back at the top of the hour and then we will finish up with this witness. Thank you.

(Recess taken.)

Okay. We are going to go back on the record. And when -- do you need another moment?

MR. WILLIS: What we would suggest doing is continue to postpone -- I'd asked the witness whether he would rather, which way he would rather do, and I think he'd rather stand down in hopes that we can finalize this agreement. So with that, I think we should postpone.

CHAIRMAN EDGAR: Okay. Well, I would -- looking at the time, I would certainly like to forge ahead and continue to conduct as much business as we can go ahead and get done here for the next little while. So is there any objection or concern from any of the participants if we ask this witness to

not be excused, to stay in the room, but to basically take a break while we continue and we go on to the next witness? Is there any concern or objection to that?

MR. SEIVER: None from FCTA.

CHAIRMAN EDGAR: No. No. Okay. Well, then thank you, sir. And, again, we will be calling you back, so please stay with us through the proceedings, but we will move on to the next witness.

THE WITNESS: Yes. Thank you.

CHAIRMAN EDGAR: Thank you.

And, Mr. Wright, the next witness is your witness.

MR. WRIGHT: Thank you, Madam Chairman.

The City of Panama City Beach and the Panama City Beach Community Redevelopment Agency call Mr. Peter J. Rant.

PETER J. RANT

was called as a witness on behalf of the City of Panama City Beach and the Panama City Beach Community Redevelopment Agency and, having been duly sworn, testified as follows:

DIRECT EXAMINATION

BY MR. WRIGHT:

Q Good morning, Mr. Rant.

A Good morning.

Q Please state your name and address for the record.

A My name is Peter J. Rant. My address is 1609 Heritage Commerce Court, Wake Forest, North Carolina.

Q Mr. Rant, you've been present for the entire proceeding since yesterday morning; is that correct?

A Yes, I have.

Q And so you took the oath of witnesses yesterday morning?

A Yes, I did.

Q Thank you. And are you the same Peter J. Rant who prepared and caused to be filed in this, in this proceeding direct testimony consisting of 24 pages?

A Yes.

Q Do you have any changes or corrections to make to that testimony?

A Yes, I do. I have one change. On Page 7, Line 5, after the word "equipment" add a close paren.

Q Thank you. And if I were to ask you the same questions contained in your prefiled direct testimony today, would your answers be the same?

A Yes, they would.

Q And do you then adopt this testimony as your sworn testimony before the Florida Public Service Commission today?

A Yes, I do.

MR. WRIGHT: Madam Chairman, if there are no objections, I would request that Mr. Rant's testimony be entered into the record as though read.

CHAIRMAN EDGAR: The prefiled testimony will be

entered into the record as though read, with the correction noted by the witness.

BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

DOCKET NO. 070299-EI, GULF POWER COMPANY'S STORM HARDENING PLAN

DIRECT TESTIMONY OF PETER J. RANT, P.E.

Q: Please state your name and business address.

A: My name is Peter J. Rant. My business address is 1609 Heritage Commerce Court, Wake Forest, North Carolina 27587.

BACKGROUND AND QUALIFICATIONS

Q: By whom are you employed, and in what position?

A: I am employed by UtilityEngineering, Inc. as Vice President. My chief responsibilities include professional engineering oversight of electric power delivery projects including overhead and underground distribution. In my capacity as a Vice President of UtilityEngineering, I provide a range of consulting services to various clients, including municipal, cooperative, and investor-owned utilities, municipalities, federal and state government entities, and private-sector companies with regard to many electric issues. For example, I advise clients on system design and construction practices and costs associated with various configurations of equipment.

Q: Please summarize your educational background and any training relevant to your testimony in this proceeding.

A: I graduated from Clarkson University in Potsdam, New York with a Bachelor of Science degree in Electrical Engineering in 1990. While obtaining this

degree, I specialized in courses within the electric power field including power systems analysis, electric power system control, transmission and distribution, and protective relaying for electric utility systems. A copy of my resume' is attached to my testimony as Exhibit ____ (PJR-1).

Q: Please summarize your employment history and work experience.

A: From 1990 to 1994 I served as a Lieutenant in the United States Army Signal Corps with responsibility for remote site power systems in various locations within the United States and Central America. In 1994 I joined Booth & Associates, Inc. in Raleigh, North Carolina and began consulting engineering for electric utilities and other owners of medium voltage electric systems, predominantly dealing with the design and construction of overhead and underground electric distribution systems. I held positions of increasing responsibility at that firm: Junior Engineer, Project Manager, Manager of Distribution Design, and Operations Manager for the Transmission and Distribution Division. In 2005, I joined UtilityEngineering, Inc., my current employer, as Vice President. I am responsible for all aspects of design of transmission and distribution lines in addition to other consulting tasks.

I have specific experience with storm hardening initiatives in coastal North Carolina. From 2000 until 2004, I was the project manager and engineer of record for an 88-mile overhead-to-underground electric distribution conversion project on four barrier islands in southeastern North Carolina. These islands, Oak Island, Holden Beach, Ocean Isle, and Sunset Beach were

and are all served by Brunswick Electric Membership Corporation (BEMC), a cooperative utility. Following the severe hurricane impacts of the mid-1990's, particularly with Hurricanes Bertha and Fran, BEMC developed a plan to improve reliability and storm restoration time by placing all barrier island lines on their system underground.

I also have significant experience with design and construction standards for electric utilities. In 2005, I was the project manager for the complete re-write of the Design and Construction Guidelines for Transmission and Distribution for the Tennessee Valley Public Power Association. These guidelines are used by over 160 utilities in at least five states for design, construction, and operation of electric distribution systems.

Q: Have you previously testified before utility regulatory authorities, in administrative proceedings before other government agencies, or in courts of law?

A: I made a presentation, not formal sworn testimony, before the Florida Public Service Commission in April 2007 regarding Florida Power & Light Company's contributions in aid of construction for underground conversion projects. My comments addressed the appropriate treatment of the cost savings from undergrounding in determining the appropriate level of such contributions. I have also prepared to testify in a number of cases that settled before trial or hearing.

Q: Do you hold any professional registrations?

A: Yes. I am a Registered Professional Engineer in the States of Florida, North Carolina, Virginia, Maryland, Tennessee, Ohio, and Arizona, and in the District of Columbia.

SUMMARY AND PURPOSE OF TESTIMONY

Q: What is the purpose of your testimony in this proceeding?

A: I am testifying on behalf of the City of Panama City Beach ("PCB") and the Panama City Beach Community Redevelopment Agency, who have asked me to provide my professional opinions regarding Gulf Power Company's ("Gulf's") proposed Storm Hardening Plan with respect to its treatment of underground installations of electric distribution facilities.

Q: Please summarize your testimony.

A: While Gulf's Storm Hardening Plan ("Plan") includes good detailed design standards (though limited in scope) for the underground ("UG") installation of electric distribution facilities, Gulf's Plan fails to adequately evaluate the costs and benefits of undergrounding as a means of protecting electric distribution facilities against storms. In particular, while Gulf's Plan with respect to alternate standards of overhead ("OH") construction appears to be based on consideration of storm restoration cost and other cost savings from using "Grade B" construction as opposed to "Grade C" construction, Gulf's Plan fails to recognize that UG installation will provide even greater benefits, because overhead facilities are not vulnerable to wind alone, but even more

vulnerable to windblown debris, or trees falling on lines. Additionally, while Gulf's assertion that UG facilities are more vulnerable to storm surge and flooding may be true in certain situations, Gulf has not provided data to support rejecting undergrounding on this basis. This conclusion on a blanket basis is not supported by my extensive experience and observations in the field including designs I have implemented for coastal utilities on barrier islands. Moreover, Gulf's own data for two of the largest cities on its system, one (Panama City Beach) a high-UG-percentage city and the other (Pensacola) a high-OH-percentage city, strongly indicate that UG provides substantial reliability and restoration benefits.

Because Gulf's Plan does not adequately address the benefits of undergrounding, the Commission should not approve Gulf's Plan, which is basically to delay gathering any further data until Gulf's customers get hit by additional named storms, while denying and minimizing the benefits of undergrounding because of a lack of "definitive proof." Instead, the Commission should require Gulf to further analyze available data and to make a real, meaningful evaluation and analysis of the benefits and costs of undergrounding as a storm hardening technique, and to return to the Commission in the near future – not 3 years from now, and not until waiting for additional named storms to strike Gulf's service area -- for further proceedings on the undergrounding aspects of Gulf's Plan. There is certainly

more than adequate historical information concerning named storm impacts both in Florida and other east coast areas.

BENEFITS OF UNDERGROUNDING

Q: What are the benefits of undergrounding as a means of reducing storm restoration costs and customer outages as a result of major storms?

A: For the obvious reason that underground facilities are underground, they are "out of harm's way" with respect to wind, windblown debris, and trees that may fall across lines from outside the rights-of-way or easements within which distribution facilities are located. Accordingly, with the rare exception of instances where a tree falls on a transformer or switch cabinet and actually causes sufficient damage to create an outage, UG facilities are not vulnerable to damages caused by wind, windblown debris, or falling trees.

Gulf Power specifically recognizes these factors as being the principal causes of damage to overhead facilities in storms. Gulf's witness Edward Battaglia testifies, at page 13 of his prefiled testimony, that "Gulf's field experience strongly indicates that pole failures on its distribution system are not the result of the wind itself during a hurricane, but rather the wind-carried debris and off right-of-way trees."

Major storms will result in damage to any electric distribution system. The duration and number of outages depends upon the level of damage to the system, and the number of spot locations on the system which are damaged. Overhead systems are fully exposed to damage along their entire lengths, and

OH restoration often involves splicing many segments and components of the system back together because major events frequently affect every span in localized areas, particularly along the coast. Underground systems do not generally sustain this degree of damage, and the replacement of the affected parts (usually the pad-mounted equipment) is comparable in time and effort to replacing overhead facilities performing the same function. With fewer locations to fix, restoration time is improved. In less severe storms, such as 2006's Tropical Storm Ernesto which struck the undergrounded barrier islands served by BEMC in North Carolina, properly designed underground systems may experience no outages at all.BEMC's UG system experienced no outages at all in Ernesto.

Q: How is this relevant to the consideration of undergrounding distribution facilities in the context of a utility's storm hardening efforts or planning?

A: In its Plan and in its witness's testimony and exhibits in this case, Gulf identified dollar benefits, in the form of additional storm restoration cost savings, from hardening of its overhead distribution system from NESC Grade C to Grade B standards/criteria. The reported benefits were shown as approximately $1,122,132 per year for each of the years 2007, 2008, and 2009, as compared to costs in those years of $53,600, $225,000, and $225,000, respectively.

Because underground facilities are not subject to any of these damages, UG facilities will necessarily provide greater benefits than will simply going

to Grade B construction. Grade B facilities will, indeed, withstand higher wind speeds than Grade C, but they will be knocked out of service by flying debris and falling trees. This is important because stronger storms (Category 2 or higher), and frequently even weaker storms, will inflict significant damage on overhead facilities by windblown debris and falling trees. Furthermore, the stronger overhead structures and even shorter spans (associated with hardened OH facilities) have minimal improvement on outages associated with broken conductors or conductor damaged by trees and wind blown debris.

In short, if increasing the strength of OH facilities from Grade C to Grade B can save $1,122,132 a year, when the Grade B facilities remain overhead and therefore remain exposed to damage from windblown debris and falling trees, then undergrounding those facilities will save more (at least on an expected-value basis). This is because UG facilities are simply not subject to these impacts. When projected over the life of the system (thirty years or more) and considering the anticipated increased major storm activity, the resulting savings significantly reduces the difference between the cost of installation of the underground versus the overhead system. Thus, undergrounding should be carefully considered and evaluated in developing a utility's storm hardening plan. For example, promoting undergrounding is a key component of FPL's "Storm Secure" plan for improving reliability and

restoration in the face of the predicted increase in major storms striking Florida.

Q: How should the PSC view this in its consideration of Gulf Power's Storm Hardening Plan?

A: The PSC should recognize that Gulf's Plan is deficient in that it fails to adequately consider the benefits that undergrounding can provide when implemented as part of a utility's storm hardening initiatives. The PSC should also recognize that Gulf's claim that its Plan is cost-effective is based on woefully incomplete analysis, in which Gulf even ignored or failed to fully account for its own data.

Q: Are there any other storm restoration benefits, either in terms of cost savings or in terms of restoration improvements that utilities can realize through undergrounding?

A: Yes, there are. In addition to direct storm restoration cost reductions due to the greatly reduced damage caused by wind, debris, and falling trees, where relatively large areas are served by underground distribution facilities, utilities realize significant additional benefits in the storm restoration environment because they don't have to deploy restoration crews to the UG-served areas, which frees up those crews to carry on restoration activities in OH-served areas. This means that the utility incurs not only less total cost, but also less overtime cost and also faster restoration of its OH-served customers.

Q: Have you observed these benefits in the real world?

A: Yes. Brunswick Electric Membership Corporation's UG-served barrier islands were impacted by a direct hit by Tropical Storm Ernesto in 2006. Not only did the UG-served barrier islands come through Ernesto without any loss of service, but BEMC's management advised me that the Coop was able to deploy restoration crews to its OH-served areas on the mainland, thereby achieving more rapid restoration of those OH areas. In fact, BEMC's operations and engineering managers have indicated that this is a frequent occurrence even during summer thunderstorms and similar events. The result is improved system reliability on a year round basis.

Additionally, these are among the benefits identified by Florida Power & Light Company as supporting and justifying the reduction in its Contribution in Aid of Construction (CIAC) for large-scale, government-sponsored UG conversion projects as currently approved in FPL's tariff.

Q: Are there additional benefits of undergrounding, i.e., benefits beyond those associated with reduced or avoided storm restoration costs?

A: Yes. Although such benefits may not technically be directly relevant in evaluating a utility's storm hardening plan, additional benefits of undergrounding include the following: (1) improved reliability and reduced restoration costs following weather events other than named tropical storms and hurricanes, such as severe summer thunderstorms, microbursts, and tornadoes; (2) preserved utility revenues, which accrue as a direct result of the

utility's being able to maintain service to UG-served areas and also as a result of more rapid restoration of other areas; (3) reduced utility exposure to claims for damages due to contact with energized facilities and due to vehicular crashes with distribution poles; (4) reduced vegetation management costs; (5) reduced pole inspection costs; and (6) reductions in other operation and maintenance costs.

FLOODING AND STORM SURGE IMPACTS

Q: Some utilities, including Gulf, assert that UG facilities are more vulnerable to damage from flooding and storm surges. Do you have an opinion regarding this assertion?

A: Yes. In some extreme instances, major storm surges can literally "wash out" the land in which UG facilities are located. When this occurs, the UG facilities are damaged and rendered inoperative. (In such instances, if the facilities serving the area were OH facilities, they would also be washed out.) And, when this does occur, replacing the UG facilities is more expensive and usually takes longer than would replacing OH facilities in the same location.

However, these "washouts" are relatively rare instances. In cases where washouts occur, service can usually be restored through looped circuits as advocated by Gulf's storm hardening plan or may not need to be restored immediately due to the complete destruction of the structures which had been served.

Additionally, such "washouts" can largely be prevented by better, "smarter" design and placement of the UG facilities. In fact, Gulf's Plan sets forth design considerations, guidelines, and specifications for UG installations in coastal environments that, in my opinion, would go a long way to avoiding such "washout" events. Many of these practices with regard to placement of facilities and system design have been implemented on Brunswick EMC's barrier islands, which have experienced no complete "washouts" and only minimal erosion, which was easily repaired in the storms that have hit those areas.

In this context, having identified good design and location specifications and principles, Gulf set the table for a good comparison of well-designed underground facilities to OH facilities in the storm hardening context, and then simply didn't follow through with any appropriate evaluation or analysis of costs and benefits as a component of its storm hardening plan.

COSTS AND DURATION OF UNDERGROUND SYSTEM OUTAGES

Q: Isn't it true that when underground distribution facilities experience outages, such outages take longer and cost more to repair or restore than OH outages?

A: It is true that repairing certain types of equipment or cable failures resulting in an UG outage takes longer than repairing many types of OH outages. However, with good utility practices, underground facilities are normally designed with loop feeds and therefore the actual outage duration is much

shorter even though the repair time is longer. Depending upon the type of damage, the repairs may not take longer than those on comparable overhead facilities. The repair time argument is often made in the context of locating, excavating, and repairing damaged underground cable. This definitely takes longer than splicing overhead conductors. Replacement of damaged pad mounted equipment such as transformers can generally be done in a comparable time to replacing an overhead piece of equipment such as a transformer.

Q: Some utilities assert that it takes longer to locate problems on their UG systems. Do you have an opinion on that assertion?

A: Yes. This assertion is probably true for some utilities, but it should not be true for utilities that install and maintain modern, current-technology UG facilities including faulted circuit indicators on equipment that allows rapid detection of the line segment with a failure. Used in conjunction with proper sectionalizing and system protective devices, looped designs, and geographic information systems (GIS) (as indicated on page 13 of Gulf's plan), and outage management and AMR systems, location and isolation of problem areas can be accomplished very rapidly on UG systems.

UNDERGROUND VS. OVERHEAD RELIABILITY ON GULF'S SYSTEM

Q: Does any of the information or data furnished by Gulf in this docket indicate whether UG facilities or OH facilities fare better in storm conditions?

A: Yes. Reviewing Gulf's data for outages experienced in Hurricane Dennis indicates that Panama City Beach, which is served by a much higher percentage of UG facilities (45 percent) than Pensacola (21 percent), fared much, much better in 2005's Hurricane Dennis.

Q: Please explain the data that support this conclusion.

A: This conclusion is based on a macro-level comparison of Gulf's OH and UG facilities in the two cities, the number of electric customers (meters) in the two cities, and various performance statistics that can be computed from Gulf's discovery responses in this case.

First, I looked at information provided by Gulf regarding the mileage of OH and UG distribution lines in Panama City Beach and in Pensacola. This was provided by Gulf in response to PCB's Interrogatory No. 7. This data shows that PCB has about 74 miles (55 percent) of OH lines and about 61 miles of UG lines (45 percent). By contrast, Pensacola has about 395 miles of OH lines (79 percent) and about 84 miles of UG lines (21 percent). (Note: Gulf's interrogatory response appears to repeat the UG line data, in that the listing includes 22 entries for UG lines, and the first 11 entries are identical to the last 11 entries, down to the last decimal point. If one accepted this information as accurate, then the percentage of UG facilities in PCB would show as about 63 percent, instead of 45 percent. Believing this to have been an inadvertent error, I assumed for these analyses that only one set of the UG entries was real.) Additionally, according to Gulf's response to PCB's

Interrogatory No. 21, Gulf has 30,848 electric customers (meters) in Panama City Beach, and 46,222 customers (meters) in Pensacola. This customer information is useful for measuring the relative reliability and restoration performance of the two systems, PCB's high-UG system and Pensacola's high-OH system, on a per-customer basis and on a per-customer-per-line-mile basis.

Next, I tried to identify whether there is any data that would provide a reasonably fair comparison of the relative performance of Panama City Beach's relatively high-UG system against Pensacola's relatively high-OH system in a storm situation. Gulf only started collecting data for individual municipalities in 2005, but it did furnish customer outage information for Pensacola and Panama City Beach for Hurricanes Dennis and Katrina, and also for tropical Storm Cindy, in response to PCB's Interrogatory No. 17. Tropical Storm Cindy's impacts were minimal, and although Katrina impacted Pensacola much more than Panama City Beach, I did not consider that to be a fair comparison, because, as we all know, Katrina made its landfall to the west of Pensacola, such that its impacts were felt much more strongly in Pensacola, in particular because Pensacola got hit by the dangerous northeast quadrant of Hurricane Katrina.

Reviewing the National Hurricane Center's final report on Hurricane Dennis, however, indicates that the conditions experienced in Dennis were fairly comparable in Panama City Beach and in Pensacola. A copy of this

report is included as Exhibit ____ (PJR-___) to my testimony. In fact, comparable detailed data for the two cities indicates that the storm conditions experienced in Panama City Beach were worse than in Pensacola; this is consistent with Dennis's having made landfall west of PCB, such that PCB was struck by the northeast quadrant of the storm. Specifically, for comparable National Ocean Service reporting stations in PCB and in Pensacola, the reported maximum sustained wind speeds were 51 knots in PCB and 35 knots in Pensacola (6-minute averages), and for the same stations, the maximum gust at PCB was 63 knots as compared to a maximum gust of 51 knots at Pensacola. (Hurricane Dennis Tropical Cyclone Report at pages 11-12.) Additionally, the storm surge and storm tide measurements – especially relevant to this discussion because of Gulf's assertion that storm surges and flooding are major drawbacks to UG installations, and also especially relevant because PCB is essentially a barrier island city – showed markedly higher values for Panama City Beach than for Pensacola: a storm surge of 5.72 feet in PCB vs. 4.16 feet in Pensacola, and a storm tide of 6.79 feet in PCB vs. 5.52 feet in Pensacola. Although other Pensacola reporting stations show two higher - and one lower - wind values for Pensacola, I believe that the specifically comparable reporting criteria for the above-cited wind data, along with the fact that the numbers are all within the same range, indicate that the conditions experienced in Dennis were, if anything,

comparable as between PCB and Pensacola, and that they were probably worse in PCB.

Next, I used the customer outage data reported by Gulf for PCB and Pensacola to compare the performance of the two systems in various ways. These figures are summarized in Exhibit ____ (PJR-___) to my testimony, which also includes copies of the cited interrogatory responses. First, looking at customer outages per line-mile of total facilities, both at peak outages and on a day-by-day basis during the restoration period, shows that PCB fared much better than Pensacola. At peak, PCB had 32.4 customers out of service per line-mile, as compared to Pensacola's 112.5 customers out per line-mile at peak. PCB fared even better as the restoration went forward: on the third day following Dennis's impact, PCB was down to less than 1 customer out per line-mile, while Pensacola was still close to 70 customers out per line-mile.

Another way of looking at this information is to examine how many customers (meters), as a percentage of total customers, were out of service at peak: for Panama City Beach, about 14 percent of Gulf's customers were out at the peak outage level, as compared to 96 percent of Pensacola customers at peak.

Another meaningful way of looking at the data is to examine the restoration rates by looking at the percentage of peak customers out of service on the third and fourth days following peak outages: for Panama City Beach,

by Day 3, more than 99 percent of customers were restored, while in Pensacola, about 62 percent remained out of service on Day 3.

Q: What, if anything, do these comparisons indicate with regard to Gulf's and the PSC's consideration of undergrounding as a storm hardening technique?

A: These measurements strongly indicate that undergrounding is, and should be recognized by Gulf and the PSC, as a meaningful tool for storm hardening, a tool that can greatly reduce restoration costs and that can greatly improve reliability in a storm situation. Even under storm conditions that were probably worse in Panama City Beach than in Pensacola, Gulf's customers in PCB fared much, much better than those in Pensacola. Because of Gulf's lack of specific data regarding failures and restoration of OH and UG facilities following the 2005 storms, we cannot know with absolute certainty how much of the better experience that PCB had is attributable to its much higher percentage of UG facilities than Pensacola, but these measurements – based directly on Gulf's own data – are compelling as an endorsement of undergrounding as a means of improving reliability in storm conditions in Gulf's service area.

These comparisons and data are even more compelling when viewed against Gulf's claimed concern about flooding and storm surges: Panama City Beach is a barrier island, exposed directly to the Gulf, and it also experienced a greater storm surge and a greater storm tide than did Pensacola, yet Gulf's

customers in Panama City Beach came through Hurricane Dennis much, much better than those in Pensacola. This type of data should be considered as a part of any comprehensive storm hardening plan.

Q: In your opinion, what implications does this have for the Commission's consideration of Gulf's Storm Hardening Plan?

A: Again, as noted elsewhere in my testimony, this data, which is Gulf's data and thus readily available to Gulf, indicates that Gulf did not do an adequate job of considering UG as a storm hardening technique. Accordingly, the PSC should not approve this part of Gulf's Plan but should require Gulf to conduct meaningful additional and more detailed analyses, and to submit these analyses to the PSC no later than next year for further consideration of its Plan in light of these analyses.

Q: Does any of the information or data furnished by Gulf in this case indicate whether OH facilities or UG facilities perform better in day-to-day conditions?

A: Yes. Gulf's SAIDI, SAIFI, and CAIDI data for Pensacola and Panama City Beach indicate that the overall reliability of service to Panama City Beach, with its much higher percentage of UG distribution facilities, has been significantly better than Pensacola's. For 2002, 2004, 2005, and 2006, the SAIDI, SAIFI, and CAIDI data all show better reliability for Gulf's customers in PCB; the values for 2003 are very close for the two cities, while the

reported values for 2004 and 2005 in particular are dramatically better for Panama City Beach.

CAIDI (Customer Average Interruption Duration Index) provides insight into the maintainability of the system and its impact on overall reliability. Gulf's CAIDI data for Pensacola and Panama City Beach, when considered in terms of the relative percentages of UG, fully supports my testimony that UG outages may not result in longer restoration time for a properly designed and constructed system. If customer interruption durations are reduced on a daily basis, it stands to reason that they can be restored more quickly following a storm event.

It is particularly surprising that Gulf did not carefully analyze this data and initiate further investigation of the relatively greater reliability shown by PCB vs. Pensacola, in light of Mr. Battaglia's testimony (page 9) that "In adopting a storm hardening activity, Gulf considers both cost-effectiveness and whether the activity meets the goal of reduced customer outages and restoration times . . . both in the aftermath of a storm occurrence and also on a day-to-day operations basis." The above analyses of Gulf's own data show that for two of the largest cities in its service area, one (Panama City Beach) with more than double the percentage of UG facilities as compared to the other (Pensacola), the high-UG city fared much better both in comparable, or even worse, storm conditions in Hurricane Dennis, and that the high-UG city also fared much better over 6 years worth of reliability observations.

Q: Is it your position that undergrounding is a panacea, and that it should be installed everywhere?

A: Not at all. There are surely some applications where UG is, at best, not cost-effective. On the other hand, based on the Gulf Power data discussed above and on other utilities' actions and my other experience in the field, we should carefully consider what the net, overall storm impacts might be (and might have been in 2004 and 2005) if Florida had undertaken a strong undergrounding initiative beginning 20 years ago.

The real point of my testimony is that undergrounding provides substantial benefits, and that those benefits have real value to utilities and their customers, both in terms of reduced storm restoration costs and other cost savings, and also in terms of reduced outage frequency and total outage duration. These benefits should be considered by utilities and the PSC, and they should be reflected in utility tariffs and programs relating to undergrounding. And thus, in the context of Gulf's Storm Hardening Plan, Gulf should have done, and should be required to do, a much better job of evaluating the benefits of undergrounding: Gulf's own data tells this story quite powerfully.

GULF POWER COMPANY'S DATA COLLECTION PROPOSALS

Q: What is your understanding of Gulf's proposals regarding data collection to evaluate the benefits and costs of undergrounding as a storm hardening measure?

A: It appears that Gulf's position on data collection is summarized in several of its responses to the PSC Staff's interrogatories, e.g., Nos. 12-15, in which Gulf indicates that it simply did not collect forensic data in either 2004 or 2005, and in which Gulf indicates that it will collect such data after future storms impact its customers. In other words, Gulf doesn't have the data because it chose not to collect it and has apparently chosen not to analyze data that it has readily available. Gulf does have a lot of photographs of worst-case impacts of storm surges on UG facilities (response to PSC Staff's Int. No. 16); if Gulf personnel could go to the field and take these photos, surely they could identify the places where these impacts were felt, and surely they could figure out what materials, and thus approximately what labor effort, were used in restoring service in these locations and other locations throughout the system for a full, thorough, and objective analysis.

Q: Please summarize your experience and familiarity with utility records concerning their UG and OH facilities, especially, as it relates to storm restoration costs.

A: I have extensive experience working with utility accounting records and "continuing property records." These are necessary tools for managing any utility system. Generally, while detailed records of labor effort for storm restoration activities are not always available, records of the materials used in storm restoration – poles, conductor (wire), conduit, transformers, cabinets, and the like – should be readily available. And, since most of these are

applicable to either OH facilities or UG facilities, but not both, it should be relatively easy for a utility to evaluate how much material was used in restoring OH service and how much was used in restoring UG service following any given storm.

Furthermore, since utility line crews and contract crews are typically segregated into OH and UG designations with specific tools and equipment for each type of work, labor and equipment costs associated with this work can be figured directly from invoices. In fact these crew rates are often based on the type of work (OH vs. UG) that they perform and thus must be separated out.

Q: Should Gulf have such data, and if so, how should Gulf have used it in preparing its Storm Hardening Plan?

A: Gulf should have ready access to this data, and it should have used such data in evaluating the costs and benefits of undergrounding as a storm hardening technique. Gulf apparently had sufficient data to estimate the benefits and costs of going from Grade C to Grade B overhead construction, so it should have comparable data to enable it to evaluate the benefits and costs of undergrounding relative to storm restoration costs. Certainly Gulf should know how many OH and UG crews were dispatched for storm restoration and their corresponding costs.

CONCLUSIONS

Q: Do you have any advice or recommendations for Gulf or the Florida Public Service Commission?

A: Yes. I would recommend that Gulf Power Company immediately undertake a serious, in-depth analysis of available data relating to the reliability, costs, and benefits of undergrounding using data from its own experience and using analogous, comparable data "borrowed" from other utilities. Rather than sitting tight until it has definitive proof, Gulf should take the initiative to identify benefits of undergrounding and should act, reasonably, to promote undergrounding in order to promote reliability and reduced outages and to obtain the storm cost savings and other benefits that are available from undergrounding. The Florida PSC should require Gulf to present, within the next 6-9 months, better analyses and a better Storm Hardening Plan, as it relates to undergrounding.

Q: Does this conclude your testimony?

A: Yes, it does.

BY MR. WRIGHT:

Q Thank you. And, Mr. Rant, did you also prepare and cause to be filed -- or prepare, compile and cause to be filed in this proceeding three exhibits which are attached to your testimony and identified therein as PJR-1, 2 and 3?

A Yes, I did.

MR. WRIGHT: Madam Chairman, I believe these have been marked for identification as Exhibits 34, 35 and 36 in what is now Exhibit 1.

CHAIRMAN EDGAR: I'm sorry. Mr. Wright, 34, 35 and 36, and I missed that last --

MR. WRIGHT: Yeah. In Exhibit 1 -- I believe that the exhibit list is now Exhibit 1 to the --

CHAIRMAN EDGAR: Yes. Yes. Okay. I understand.

MR. WRIGHT: Okay.

CHAIRMAN EDGAR: Got you. Yes. That is correct.

MR. WRIGHT: Thank you. And so with the exhibits marked for identification and Mr. Rant's testimony entered, I would ask that he summarize his testimony for the Commission.

CHAIRMAN EDGAR: Okay. Actually I did not enter the exhibits.

MR. WRIGHT: I think I just said they were marked for identification.

CHAIRMAN EDGAR: They're just marked. Okay. I'm sorry. We are just not communicating right now, Mr. Wright.

Okay. The exhibits are so marked as you have described. We will take them up at the conclusion of the testimony, and we look forward to the witness's summary.

(Exhibits 34, 35 and 36 marked for identification.)

MR. WRIGHT: Thank you, Madam Chairman.

BY MR. WRIGHT:

Q Mr. Rant, proceed.

A Thank you, Madam Chairman, Commissioners.

Gulf Power has taken a significant step forward with its Storm Hardening Plan and included ten-point initiatives. The plan is clearly focused on improving the overhead portion of Gulf's system beyond what is strictly required by the NESC in order to improve storm restoration and system reliability. However, the plan falls short with regard to its analysis of potential targeted undergrounding of distribution lines. It is my professional opinion that the Commission should not approve the plan as submitted. The Commission should request that Gulf revisit undergrounding based upon data that is currently available to them.

Gulf should include this analysis and continue with its other efforts to capture and utilize data regarding the costs and benefits of undergrounding in its efforts to improve storm restoration and reliability. The potential benefits of targeted undergrounding include reduced system wind damage, improved storm response by freeing up crews for overhead

restoration, preserve revenues from avoided outages, reduce vegetation management costs, reduce pole inspection costs, and reduced exposure to legal costs due to contact accidents.

Underground construction is normally more expensive than overhead construction. Targeting underground conversion projects to areas which yield the most reliability gains results in an optimized system performance result. Gulf should consider this within the context of its Storm Hardening Plan.

I've drawn these conclusions based upon my experience designing overhead and underground electric distribution lines over the last 14 years. Specifically from 2000 to 2004 I managed a storm hardening project for Brunswick EMC, a cooperative utility in coastal North Carolina. The project consisted of undergrounding all of the remaining overhead lines on each of four barrier islands served by the cooperative. This part of North Carolina was hit directly by Hurricanes Bertha, Fran and Bonnie in the mid 1990s. The cooperative experienced major damage to its overhead lines along the coast and determined the necessity to harden its system.

In reviewing storm restoration efforts, Brunswick management made the key observation that portions of the system that were already underground faired much better during major and minor storm events. They focused their efforts toward undergrounding areas that were the most problematic to restore. Following a review of the recurring restoration costs, the

cooperative, supported in its efforts by FEMA, developed its own undergrounding initiative, including the part of the plan which I managed.

Since completing this project, Brunswick has been hit directly by Tropical Storm Ernesto in 2006, which resulted in outages to thousands of their customers in overhead served areas and no outages in its recently undergrounded areas. Additionally, on a daily basis even during summer thunderstorms Brunswick experienced greater reliability on its underground system.

The key point is that Gulf's Storm Hardening Plan should include undergrounding to a greater extent than it does as submitted. Gulf's own data related to Hurricane Dennis in 2005 suggests that Panama City Beach, a high underground percentage area with direct Gulf exposure, faired better and was restored more quickly than Pensacola, which experienced similar weather conditions but which is served mostly by overhead lines.

Specifically the differences were dramatic. The peak number of outages experienced during Hurricane Dennis were respectively 14 percent of Gulf's customers in Panama City Beach and 96 percent of Gulf's customers in Pensacola. These areas are certainly not identical, but this data taken in the, in the context of the general body of knowledge certainly suggests that targeting, targeted undergrounding should be

considered as a component in the Storm Hardening Plan.

Should undergrounding be done on a blanket basis? Absolutely not. However, I do believe that Gulf's plan as amended does not adequately include evaluation and incorporation of undergrounding. The plan presents significant savings derived from its adoption of NESC Grade B overhead standards, which does not fully present potential savings derived from undergrounding. The plan includes substantial data collection efforts going forward on this issue, which we fully support.

Gulf has data available at present to evaluate costs and benefits of targeted undergrounding and should include undergrounding in its Storm Hardening Plan as other utilities have done.

Based upon the current body of knowledge with regard to underground construction technology, costs, savings and performance, this Commission should reject Gulf's plan and require it to resubmit the plan with a more detailed consideration of undergrounding. If Gulf's plan is approved as amended, it will result in delayed and/or reduced use of undergrounding in its hardening measures most likely for years to come while Gulf further studies data from additional storms.

Gulf's customers in areas that could be undergrounded will continue to experience outages that might otherwise be avoided. And FPL has identified in its efforts costs and

benefits of targeted undergrounding and included the shared cost approach to communities desiring underground electric facilities through its GAF credit in its approved tariff. Gulf Power has access to similar data on its system and should include a full consideration of targeted undergrounding in its Storm Hardening Plan now.

Undergrounding provides substantial benefits and those benefits have real value to utilities and their customers both in terms of reduced storm restoration time and other benefits that should be considered in the context of Gulf's Storm Hardening Plan.

CHAIRMAN EDGAR: Thank you.

MR. WRIGHT: Madam Chairman, Mr. Rant is available for cross-examination.

CHAIRMAN EDGAR: Thank you. Are there questions on cross from Gulf?

MR. BADDERS: At this point we do not have questions, but we would like to reserve the right, if questions do come from the bench or from other parties, to possibly respond to that.

CHAIRMAN EDGAR: Okay. Are there questions from any of the other parties in this case on cross?

MR. SEIVER: FCTA has no questions.

CHAIRMAN EDGAR: No questions. AT&T, no questions. No questions. Embarq, no questions. No questions. Questions

from staff.

MS. FLEMING: No questions.

CHAIRMAN EDGAR: No questions from staff. Questions from Commissioners. No questions. Mr. Badders, no questions.

MR. BADDERS: No questions.

CHAIRMAN EDGAR: No questions. Okay.

MR. WRIGHT: Thank you, Madam Chairman. And I would move the admission of Exhibits 34, 35 and 36 into the record of the case.

MR. BADDERS: No objection.

CHAIRMAN EDGAR: Okay. Seeing no objection, Exhibits 34, 35 and 36 will be moved into the record.

(Exhibits 34, 35 and 36 admitted into the record.)

MR. WRIGHT: Thank you. And I believe that Mr. Rant may be excused.

CHAIRMAN EDGAR: The witness may be excused. Thank you.

MR. WRIGHT: Thank you, Madam Chairman.

Next the City of Panama City Beach and the Panama City Beach Community Redevelopment Agency call Mr. R. L. Willoughby.

R. L. WILLOUGHBY

was called as a witness on behalf of the City of Panama City Beach and the Panama City Beach Community Redevelopment Agency and, having been duly sworn, testified as follows:

DIRECT EXAMINATION

BY MR. WRIGHT:

Q Good morning, Mr. Willoughby. Will you please state your name and address for the record?

A R. L. Willoughby, 1609 Heritage Commerce Court, Wake Forest, North Carolina.

Q Mr. Willoughby, you were sworn in along with all the other witnesses yesterday morning, were you not?

A Yes, I was.

Q Thank you. Are you the same R. L. Willoughby who prepared and caused to be filed in this proceeding prefiled direct testimony consisting of 11 pages?

A Yes.

Q Do you have any changes or corrections to make to that testimony?

A I do not.

Q If I were to ask you the same questions contained in that testimony today, would your answers be the same?

A Yes.

Q And do you then adopt this testimony as your sworn testimony before the Florida Public Service Commission today?

A I do.

Q Thank you.

MR. WRIGHT: Madam Chairman, if there are no objections, I would request that Mr. Willoughby's testimony be

entered into the record as though read.

CHAIRMAN EDGAR: The prefiled direct testimony will be entered into the record as though read.

MR. WRIGHT: Thank you.

BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

DOCKET NO. 070299-EI, GULF POWER COMPANY'S STORM HARDENING PLAN

DIRECT TESTIMONY OF R.L. WILLOUGHBY

Q: Please state your name and business address.

A: My name is R.L. Willoughby, and my business address is 1609 Heritage Commerce Court, Wake Forest, North Carolina 27587.

BACKGROUND AND QUALIFICATIONS

Q: By whom are you employed, and in what position?

A: I am employed by PowerServices, Inc., as Vice President. In my capacity as a Vice President of PowerServices, I provide a range of consulting services to various clients, including municipal and investor-owned utilities, municipalities, and private-sector companies with regard to many electric issues. For example, I advise clients on energy efficiency matters and on how best to set up their facilities, including overhead and underground distribution facilities, inside-the-fence power supply arrangements, and so on.

Q: Please summarize your educational background and any training relevant to your testimony in this proceeding.

A: I have a Masters Degree in Administration from Central Michigan University (1992), a Bachelor of Science Degree in Business Management

from Mt Olive College (1988), and an Associate of Arts & Sciences Degree in Industrial Management from Lenoir Community College (1987). In addition, over my career, I have attended numerous seminars, short courses, and continuing education courses in electric utility engineering and management. A copy of my resume' is included as Exhibit ____(RLW-1) to my testimony.

Q: Please summarize your employment history and work experience.

A: I have over 40 years experience working in the operation and management of electric transmission and distribution systems. From 2005 to the present, I have been in my current position as Vice President with PowerServices Inc. From 2003 to 2005, I was Director of Management Services with Booth & Associates, Inc. From 1996 to 2003, I served as City Manager of the City of Washington, North Carolina, and from 1988 to 1996, I was the Electric Utility Director for the City of Washington. From 1985 to 1988, I was Electric System Manager for the City of Kinston, NC. From 1968 to 1970 and from 1971 to 1985, I held various jobs with increasing responsibilities in the Electric Department of the City of Kinston. In 1970 and 1971, I was a Line Foreman with E&R, Inc, where I supervised crews of electric line workers. In 1967 and 1968, I held various positions, working with electric utility facilities, with the Greenville Utilities Commission in Greenville, NC.

Q: Please summarize any responsible positions other than previously listed work experience that is relevant to your testimony.

A: From 2000 through 2005 I served on the Board of Directors for ElectriCities of North Carolina Inc. In 2001, I was Vice Chairman, and in 2002 I was Chairman of ElectriCities' Board of Directors.

Q: What is the primary function of ElectriCities of NC?

A: ElectriCities of NC is the management organization for the two municipally owned power agencies in North Carolina, the North Carolina Eastern Municipal Power Agency (NCEMPA) and North Carolina Municipal Power Agency 1 (NCMPA 1). These two power agencies are the full requirements providers for 51 municipal electric utilities in NC with a combined annual demand of 3,000 megawatts and a $1 billion annual budget. The two Power Agencies have ownership interests in 4 nuclear plants and 2 fossil fuel generation plants in North Carolina.

ElectriCities also functions as a Joint Municipal Assistance Agency with 90 members in North Carolina, Virginia and South Carolina. The Assistance Agency provides customer service, safety training, emergency & technical assistance, and government and legal affairs services to ElectriCities' members. During hurricanes, ice storms, and other natural disasters, ElectriCities is instrumental in assisting all its members with Joint Municipal Assistance and Communications. ElectriCities is a member of the State Emergency Response Team (SERT) in North Carolina; the SERT

Team insures proper flow of information to maximize resource allocation during State emergencies.

Prior to serving on the ElectriCities Board of Directors, I was selected by my peers to serve as Chairman of the ElectriCities Standards Committee. This committee was formed to aid the municipal systems with standardization of overhead and underground design and materials.

Q: What is your experience dealing with overhead and underground electric facilities?

A: The electric utility systems I directly worked for, including those serving Greenville, Kinston, and Washington, NC, owned and operated both transmission and distribution facilities. The systems had both overhead and underground distribution facilities. When I began my utility career in the late 1960s, the amount of underground facilities was limited, but as technology improved and costs came down, more and more distribution facilities were placed underground. All the new subdivisions built in Washington, Kinston and the vast majority of ElectriCities member cities in the last ten years have underground electric distribution facilities.

As municipal utility systems serving our citizens and customers, we supported underground facilities because a properly designed and maintained underground system has lower operations and maintenance costs, has lower storm restoration costs, is more reliable in hurricanes and in other extreme and ordinary weather events, and is safer to the public.

Early in my career, I constructed and installed overhead and underground electric distribution facilities. I also had to respond to power outages 24 hours a day for a one-week rotation every 4-5 weeks.

Where the utilities I worked with experienced problems with underground facilities, those problems were almost always with old-vintage cables and equipment or with improperly installed cables.

In North Carolina, in addition to a fair number of hurricanes and tropical storms, we have to deal with numerous thunderstorms in the summer months and occasionally with ice storms in the winter. The utilities that I worked with had very few problems with underground distribution facilities associated with major storms (hurricanes and tropical storms) or thunderstorms, which were the primary cause for significant customer outages on our systems. Additionally, the utilities that I worked with had virtually no problems with our underground systems in ice storms.

Q: Have you previously testified before utility regulatory authorities, in administrative proceedings before other government agencies, or in courts of law?

A: I made a presentation, not formal sworn testimony, to the Florida Public Service Commission in April 2007, regarding Florida Power & Light Company's contributions in aid of construction for underground conversion projects. My comments addressed the appropriate treatment of the cost savings from undergrounding in determining the appropriate level of such

contributions. In my long career of service to North Carolina cities, I testified many times before city commissions and councils.

SUMMARY AND PURPOSE OF TESTIMONY

Q: What is the purpose of your testimony in this proceeding?

A: I have been asked by the City of Panama City Beach and the Panama City Beach Community Redevelopment Agency to testify regarding my opinions, as a former municipal electric utility director and city manager, and as a board member of two major municipal power agencies (over 3,000 megawatts of delivered power capacity), regarding Gulf's proposed Storm Hardening Plan.

Q: Please summarize your testimony.

A: It has been my experience not only as a manager and supervisor but also a technician (line worker) responsible for power restoration during all types of inclement weather that underground electric facilities are far superior to that of overhead facilities when compared to reliability, reduction in restoration costs, reduction in normal O&M costs, public safety, and reduction in lost revenues.

As City Manager of Washington, North Carolina from 1996 to 2003, I was the head of Washington's city government when our electric utility system experienced 5 named storms. Hurricane Fran in 1996, Hurricane Bertha in 1996, Hurricane Bonnie in 1998, Hurricane Dennis in 1999, and Hurricane Floyd in 1999. Hurricane Dennis was a Tropical Storm when it

came through Washington. Even with extensive flooding of the brackish waters of Pamlico Sound, our underground distribution system performed very well.

I believe that Gulf's claims that it lacks data to evaluate the benefits and costs of undergrounding are surprising, and that Gulf should examine its own data carefully and proceed toward a thorough evaluation of undergrounding as a storm hardening and reliability improvement measure.

GULF'S DATA COLLECTION PROPOSALS

Q: Please summarize your familiarity with utility records and data regarding

A: The utilities I worked with used typical budget guidelines for accounting of expenses. The major groupings were Administration, Support Services, Operations & Maintenance, and Capital. Within the O&M and Capital budgets we further delineated between underground and overhead.

Sometimes if we knew a major storm was approaching we would set up specific cost centers for that event with the subcategories.

Regardless, we always had separate cost centers to identify our costs for underground repairs, overhead repairs, or capital expenses for each.

Q: From your experience, do you have any reaction or opinion regarding Gulf's apparent position that it lacks data and lacks "definitive proof" of the benefits of undergrounding as a means of improving reliability and reducing costs in and following major storm events?

A: Yes. To say the least, I find it surprising. It is inconceivable to me that a utility such as Gulf Power could not access its historical records for comparable if not better data particularly since they are a regulated utility and neither Washington nor Kinston where I served were. Regarding cost information, while I would agree that keeping exact track of labor costs in a storm restoration effort may be difficult, I would not agree that keeping track of the materials used in storm restoration is difficult at all. And, since any utility should have a good handle on the materials that it uses in storm restoration, it should be fairly easy to estimate the labor involved for underground and overhead restoration by analyzing the breakdowns of materials used.

The municipal utilities that I worked for had this information. And, even though we could easily quantify the different cost centers to identify the costs associated with overhead and underground repairs and restoration efforts, it was readily apparent to me and the electric department management that virtually all of our storm restoration costs, other than routine post-storm checking of our UG system, were associated with the OH system.

Q: From your experience, do you have any reaction or opinion regarding Gulf's plans to essentially wait to do anything further with undergrounding until additional data becomes available when future storms hit Gulf's service area?

A: Yes, I do. First, although Mr. Battaglia's testimony states (page 10) that Gulf's Plan describes certain UG "pilot projects," when I look to the referenced Section 6.0 of the Plan, I do not see any such projects identified or described. I believe that waiting to act, based on Gulf's claim (in its response to Panama City Beach's Interrogatory No. 41) that there is no "definitive proof" of the benefits of undergrounding, is unwise and unsound, and not in the best interests of Gulf's customers or Gulf itself.

Any well-managed utility, and I believe that Gulf is generally a well-managed utility, should have sufficient information to analyze the benefits and costs of undergrounding. In fact, my colleague, Peter Rant, P.E., presents analyses of the experience of a high-UG-percent city, Panama City Beach, and a high-OH-percent city, Pensacola, in similar storm conditions experienced in Hurricane Dennis. Based on Gulf's own data, it appears that Panama City Beach, a barrier island that experienced a higher storm surge than Pensacola, fared much better under comparable conditions than the high-UG city. At the very least, Gulf should have examined this data and should, accordingly, be investigating undergrounding much more seriously than it appears to be.

FLOODING AND STORM SURGE IMPACTS

Q: Some utilities, including Gulf, assert that UG facilities are more vulnerable to damage from flooding and storm surges. Do you have any experience relative to this assertion?

A: Yes. Like most people who work with electric distribution facilities, both underground and overhead, I am familiar with the unusual event of a "washout" of underground facilities in extreme storm surge events. However, it is my experience that these events are very unusual.

Additionally, my specific experience with 5 named storms while I was City Manager of Washington, North Carolina, is that underground facilities, especially where they are properly designed, installed, and maintained, suffer minimal permanent damage from flooding and virtually none from other storm related issues.

Washington is a city of approximately 10,000 residents with 25,000 residents within 1.5 miles of the city. Washington is on the east coast of North Carolina, on the Pamlico River near the mouth of the Pamlico Sound. The Electric System serves approximately 12,000 customers over 350 miles of line. Approximately 10%-15% of the system is underground.

In those storms, we not only experienced extensive damage to our overhead system from the winds and windblown debris from these storms, we also experienced extensive flooding by the brackish waters of Pamlico Sound. The outages we had on the underground system were associated with flooding where we had live front equipment. As soon as the water subsided, we could reenergize those lines immediately. We had no problems with the UG components of our system, from wind-related issues.

CONCLUSIONS

Q: Do you have any advice or recommendations for Gulf or the Florida Public Service Commission?

A: Yes. I would recommend that Gulf Power Company immediately undertake a serious, in-depth analysis of available data relating to the reliability, costs, and benefits of undergrounding using data from its own experience and using "borrowed" data from other utilities. Rather than sitting tight until it has definitive proof, Gulf should take the initiative to identify benefits of undergrounding and should act, reasonably, to promote undergrounding in order to promote reliability and reduced outages and to obtain the storm cost savings and other benefits that are available from undergrounding. The Florida PSC should require Gulf to come back before it soon, within the next 6-9 months, with better analyses and a better Storm Hardening Plan, as it relates to undergrounding.

Q: Does this conclude your testimony?

A: Yes, it does.

BY MR. WRIGHT:

Q And, Mr. Willoughby, did you also attach to your prefiled direct testimony one exhibit consisting of your resume and designated as RLW-1?

A I did.

Q Thank you.

MR. WRIGHT: Madam Chairman, I believe that exhibit has been marked as Exhibit Number 37.

CHAIRMAN EDGAR: Yes.

(Exhibit 37 marked for identification.)

MR. WRIGHT: Thanks. And I would, with your indulgence, ask Mr. Willoughby to summarize his testimony for the Commission.

THE WITNESS: Madam Chairman, Commissioners, I was asked by Panama City Beach and Panama City Beach Community Redevelopment Agency to give my opinions regarding Gulf Power's Storm Hardening Plan. I state this opinion based on my 40 years of experience in operations and management of electric transmission and distribution systems. The first 15 to 20 years of my career was primarily with construction and maintenance of underground and overhead facilities. I had quite a bit of hands-on experience with actual power restoration during minor storms, major storms and just routine events. The last 20 years or so I've been in administration and management.

Early in my career as a power lineman and also later as a utility director I have personally experienced the frustrations of extended power outages during minor and major storm events, and later as city manager I had to deal with the financial and the political issues of operating a local distribution system. Since then and during my tenure in this business, technology has improved a great deal with undergrounding as well as improved training for the employees that place the underground facilities in, and with this it's becoming a normal and typical application for most utilities. In fact, the utilities I work with, probably over 95 percent of all new construction was underground and most of the clients that we currently work for now, most of their utilities are going underground.

I've worked in many minor and major storm events in my career. While I was a manager in Washington, North Carolina, I had specific experience with five named hurricanes or five named storms, one of them was a tropical storm when it hit Washington, and it confirmed the value of undergrounding facilities when properly designed, properly installed and properly maintained as suffering minimal damage from, from flooding and from other storm-related events.

In the storms that we experienced, in these five storms that we experienced, extensive damage was done to our overhead system through wind and wind-blown debris, and we also

had extensive flooding. The underground -- the overhead facilities faired poorly during the, during the storm events but our underground facilities faired very well. The only underground outages we had were where we had live front equipment and the flooding came and got above the energized bus so that we had to de-energize the equipment. But when the waters receded, we were able to energize the facilities right away and those came back up. We had no wind-related problems to our underground system. The only extended outages we had on the underground was where an underground section might be served from an overhead line. The overhead would be on the source side, if you will. And if the overhead was out for an extended while, we couldn't get the underground back on, but the underground was ready for energization in these events.

Today I have no specific criticism of Gulf Power's overhead storm hardening recommendations. In addition, their hardening design specification for their underground has positive enhancements. I do believe, however, that Gulf Power should take a more definitive approach to evaluating underground as a greater component of their Storm Hardening Plan. I am not recommending blanket undergrounding of everything. But it has been my experience, as I said earlier, properly designed, installed and maintained underground facilities have, have no more operation, excuse me, operation and maintenance costs than overhead, and quite often less costs

and operation and maintenance costs. And in addition, during minor and major storm events they've proven to be more reliable and time, time saved and cost, cost savings, too.

I believe Gulf Power's overhead Storm Hardening Plan is a positive approach to improving reliability. However, I believe they should take a more proactive approach to underground as a component of the Storm Hardening Plan. Sufficient information should be available to analyze the benefits and costs for undergrounding and should be readily available to Gulf Power. I believe they should use this data as well as data from other utilities as necessary to actively evaluate the reliability and cost benefits of undergrounding and include this as a part of their underground storm -- as part of their Storm Hardening Plan. That concludes my summary.

MR. WRIGHT: Thank you, Mr. Willoughby.

Madam Chairman, Mr. Willoughby is available for cross-examination.

CHAIRMAN EDGAR: Thank you.

Mr. Badders, let me come back to you in a moment, if I may.

Commissioner Carter, did you have a question?

COMMISSIONER CARTER: Thank you, Madam Chairman. I was listening both to Mr. Rant and Mr. Willoughby, and I think that you said that notwithstanding undergrounding, were the source in terms of the connectivity from the power source, if

that goes out, then all the power is out. That's what you said; right?

THE WITNESS: Quite often the overhead line serves the underground because the overhead is closer to the source quite often, and if that's off, the underground is off. However, if you have your forces and crews working on the overhead and get it on, as soon as it's on, the underground is on. Of course, that lends itself to putting more underground in, you would think. But that is some of the dilemma with underground because quite often it's served from an overhead feeder.

COMMISSIONER CARTER: Madam Chairman, if you'd permit to follow up.

Do you know of any system anywhere in the country where the actual source is underground as well?

THE WITNESS: I guess it depends on what you call the source. In this context I'm calling the source the substation.

COMMISSIONER CARTER: Let me define it for you. Let me define it for you.

THE WITNESS: Okay.

COMMISSIONER CARTER: The connectivity so that you can get some juice.

THE WITNESS: Well, again, that would depend, is it a generating plant, is it a transmission line or is it distribution? But not trying to be facetious, but

traditionally at a distribution level we would determine, we would, I would identify it as directly out of the substation. Now you could have overhead transmission lines serving the substation, but most often transmission lines aren't affected quite as much because of maintenance and tree trimming and that sort of thing. However, I do know of a few places, I can't recall off the top of my head, that directly out of the substation the facilities are underground. Quite often those are in downtown areas with network systems and things such as that, but there are some places likes that. It doesn't mean there couldn't be more.

COMMISSIONER CARTER: But no, no direct -- Madam Chairman. But a substation in and of itself is not the source of the power. It's a place where the power is distributed from the, the plant itself to go to different sections.

THE WITNESS: The substation is the source of the, typically the source of the distribution power.

COMMISSIONER CARTER: Right.

THE WITNESS: That's where distribution and transmission typically are separated.

COMMISSIONER CARTER: Madam Chairman. You understand what I'm asking you?

THE WITNESS: Yes, sir.

COMMISSIONER CARTER: Because I hear what you're saying, and I appreciate that, about undergrounding. We've had

tremendous discussion about that. The fact of the matter is if the source is overhead and you're connecting to an underground, you lose the source overhead, you're still out of power.

THE WITNESS: Until that component is fixed. And when that's fixed, then you don't have any -- you should not have any additional work to do to get the distribution up because it's underground. But your point is well-taken, yes, sir.

COMMISSIONER CARTER: And because -- Madam Chairman. And because we've had so much discussion about undergrounding, I was wondering if there were a situation anywhere in the country where they had gone the extraordinary step to connect with the source for the undergrounding. Because it seems like to me, excuse me, it seems like to me it's, you're still halfway there. If you've got the, the connectivity to the residential units or commercial units underground but the source from the plant is coming overhead, you still, that's still the Achilles' heel, wouldn't you agree?

THE WITNESS: I would agree that that is additional exposure. Yes, sir.

COMMISSIONER CARTER: Thank you.

CHAIRMAN EDGAR: Commissioner Argenziano.

COMMISSIONER ARGENZIANO: Well, Commissioner Carter, I heard the same thing and I wrote the question down because that sparked my interest because I hadn't thought of that. But

yet in the discussion I think -- at some point I guess, and I don't know if you can give me this, this number, I guess -- how many or what percentage of underground lines are serviced by aboveground? I guess they all are to some degree. But also in, in what Commissioner Carter was asking you, even though it's still an Achilles' heel, you still have that whole underground line that does not have to be put back up once you get the aboveground up.

THE WITNESS: That's correct. That's absolutely correct.

COMMISSIONER ARGENZIANO: So that would then expedite services along that whole underground line also.

THE WITNESS: And in addition to that, instead of having crews working on the underground section that could be overhead, they've got all their resources allocated to their overhead section. So you can allocate your resources, more of your resources to those smaller areas the more you underground.

COMMISSIONER ARGENZIANO: And one other -- and I would imagine that if you had taken the time and the money to put in underground lines, that the aboveground lines that are servicing the underground lines would be hardened first.

THE WITNESS: One would hope that would be an integral part of the plan.

COMMISSIONER ARGENZIANO: Well, that -- I'd hope so. Okay. Thank you.

CHAIRMAN EDGAR: Commissioner Skop.

COMMISSIONER SKOP: Thank you, Madam Chair.

Just along those lines of questioning as a quick follow-up. What is your experience with existing undergrounding to the extent that -- you know, I think that you have admitted in your testimony that it's traditionally more expensive than overhead. But I think that in some of the hearings that we've held, and we've got some, again, additional information, it seems like undergrounding, there are some inherent problems to the extent of service restoration with -- like, if it were in a coastal region and you had storm surge, that it would be covered with huge volumes of sand and/or flooding or other issues, and I just wanted to get you to briefly speak to that, if you could, please.

THE WITNESS: If you have some major erosion or, or beach wash or backwash, those things could happen. The areas I've been experienced with and worked with, that's been very minimal. That's not to say it couldn't happen. But even said that, that's still typically, in my opinion, typically less time-consuming to get that resolved than be putting poles and wires and that sort of thing up and getting trees cleared out of the way.

COMMISSIONER SKOP: Thank you.

CHAIRMAN EDGAR: And there are no questions from staff or from the other parties. I will come back to you,

Mr. Badders.

MR. SEIVER: No questions.

CHAIRMAN EDGAR: No questions. No questions. No questions. Mr. Badders.

MR. BADDERS: No questions.

CHAIRMAN EDGAR: No questions.

Questions on redirect?

MR. WRIGHT: No thank you, Madam Chairman. We appreciate it.

CHAIRMAN EDGAR: Okay. Oh, Commissioner Carter.

COMMISSIONER CARTER: Just kind of following up on what Commissioner Argenziano was saying is that it would seem to me to make sense that if you're connecting to underground, that you would want to harden the overhead structures maybe to, like you're saying, coming to the substations. I guess that would be more of a distribution line or a transmission line, and, you know, reinforce that greatly because you know the power from that substation goes to the entire area, geographical area. Has that been your experience, what you've found in areas --

THE WITNESS: I would absolutely agree. That should be part of the overall plan to have the segments that can be put in underground reasonably and that customers may be willing to pay a premium for that. And the overhead lines serving it, you would absolutely want that part of your overall plan to

improve reliability.

CHAIRMAN EDGAR: Commissioner Argenziano.

COMMISSIONER ARGENZIANO: Just another question. Out of curiosity, how deep are the lines underground? How deep do you have to go?

THE WITNESS: It varies with the voltage, and a lot of times it varies with the other utilities around because traditionally your high voltage, your high voltage -- when I say high voltage, distribution high voltage from 7 kV to 15 kV, something like that -- is three to four feet. Most people try to go within four feet there. And it depends on whether it's in conduit or not. And quite often they go deeper than that just to get clearance from other like water lines, sewer lines, telephone cables, that sort of thing.

COMMISSIONER ARGENZIANO: If you're going deeper, I would imagine some of the cost calculations would be if you encounter lime rock?

THE WITNESS: It can be. And the unknowns of going deeper. Directional boring has been a very beneficial addition to the technology of undergrounding. And in my opinion, even though directional boring can be more expensive than opening a trench, quite often it can be less expensive because of the disruptive -- lack of disruption to the aboveground trees and shrubbery, that sort of thing, as well as, you know, to go through some of these areas you would hit some unusual.

COMMISSIONER ARGENZIANO: And I guess the reason I'm asking is I wonder if you start to underground, if you all of the sudden come up with a whole batch of lime rock, of course the costs are going to go up to get through that lime rock. Is there any kind of echo sonar or whatever they call it that's done ahead of time or is that -- or do you calculate that ahead of time in undergrounding?

THE WITNESS: You can. I would think most utilities that are doing work in certain areas -- you could have a spot that's just, you don't recognize is there, but most of them probably have the experience in working in areas, they know about what the soils are in certain areas. And you could -- I don't think that's a major problem. It can on a site-specific case be a problem. But on the grand scheme of undergrounding I don't see it as being a big deal. It can be in a spotted location, yes.

COMMISSIONER ARGENZIANO: Okay. Madam Chair. The only reason I mentioned that, I was wondering, I know that when they're laying water lines throughout the state a lot of times they hit lime rock and it brings up the cost quite a bit than what's anticipated upfront and then you could start something and then later wind up having a greater, greater cost. So I didn't know if that was taken into consideration before the lines are laid.

THE WITNESS: And you could, excuse me, and you could

do soil borings ahead of time if you were concerned about things like that to get a better idea of it.

COMMISSIONER ARGENZIANO: Okay. Thank you.

CHAIRMAN EDGAR: Thank you.

Okay. Let's take up the exhibit.

MR. WRIGHT: Thank you. We would move the admission of Exhibit 37, Madam Chairman.

CHAIRMAN EDGAR: Okay. Seeing no objection, Exhibit 37 will be entered into the record, and the witness is excused. Thank you very much.

MR. WRIGHT: Thank you.

(Exhibit 37 admitted into the record.)

CHAIRMAN EDGAR: Mr. Willis --

MR. WILLIS: We would --

CHAIRMAN EDGAR: -- what is your pleasure?

MR. WILLIS: We would suggest that you take -- proceed to the rebuttal witnesses but take Regan Haines after Manny Miranda. What I would anticipate doing is that after Manny Miranda completes his rebuttal, to then come back to Mr. Harrelson, if necessary, and then to Mr. Haines, if necessary.

CHAIRMAN EDGAR: Okay. So I just want to make sure I've got it straight. Okay. So realizing that you have shared with us that TECO and FCTA are still in discussions, so --

MR. WILLIS: Correct.

CHAIRMAN EDGAR: -- you're asking that we hold on Witness Haines. And, Ms. Fleming, thoughts?

MS. FLEMING: I'm processing this information. We recognize that we would like to encourage stipulation among the parties. I think it would -- if it doesn't confuse the record for any of the parties, we can move forward with the rebuttal testimony if that's the Commission's pleasure.

CHAIRMAN EDGAR: Can I ask you, Mr. Willis, and as Ms. Fleming has stated, of course, I agree that we do try to encourage these sorts of discussions and certainly want to do anything we can to facilitate or not throw up burdens. However, it is a little, of course, unusual to move into rebuttal testimony with direct still hanging out there. So can you give me a feel for about what your time frame you think you're looking at? And, of course, part of the reason I'm asking, other than just general curiosity, is, you know, we could take an early lunch break and then come, come back after lunch and see where we're at if you think that that might be productive.

MR. WILLIS: We have an agreement that we're willing to sign that is, has been presented to FCTA, and they're checking with their client basically is what I think the situation is.

MS. BROWNE: That's correct, Madam Chair. And I think that if we broke and came back after an early lunch, that

would likely be enough time for us to reach a resolution or not, to have an answer.

CHAIRMAN EDGAR: Okay. Commissioners, any concerns if we go ahead and take an earlier lunch break, give the parties additional time?

Okay. Then let's go ahead, we will take a slightly early break. It is about 20 to 12:00. Let's come back at 1:00. Does that work, Commissioners? Does that work?

Okay. We are on lunch break, and we will be back at 1:00. Thank you.

MS. BROWNE: Thank you, Madam Chair.

(Lunch recess taken.)

(Transcript continues in sequence with Volume 4.)

STATE OF FLORIDA)
: CERTIFICATE OF REPORTER
COUNTY OF LEON)

I, LINDA BOLES, RPR, CRR, Official Commission Reporter, do hereby certify that the foregoing proceeding was heard at the time and place herein stated.

IT IS FURTHER CERTIFIED that I stenographically reported the said proceedings; that the same has been transcribed under my direct supervision; and that this transcript constitutes a true transcription of my notes of said proceedings.

I FURTHER CERTIFY that I am not a relative, employee, attorney or counsel of any of the parties, nor am I a relative or employee of any of the parties' attorneys or counsel connected with the action, nor am I financially interested in the action.

DATED THIS 18th day of October, 2007.

Linda Boles

LINDA BOLES, RPR, CRR
FPSC Official Commission Reporter
(850) 413-6734