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September 7, 2007

Via Hand Delivery

Ms. Ann Cole
Commission Clerk
Florida Public Service Commission
2540 Shumard Oak Boulevard
Tallahassee, FL 32399-0850

Re: Docket No. 070297-EI
Review of 2007 Electric Infrastructure Storm Hardening Plan Filed Pursuant To Rule 25-6.0342, Florida Administrative Code, Submitted by Tampa Electric Company

Dear Ms. Cole:

Enclosed for filing in the above matter are an original and 15 copies of the Direct Testimony of Michael T. Harrelson on behalf of Florida Cable Telecommunications Association, Inc. Service has been made as indicated on the Certificate of Service. If there are any questions regarding this filing, please contact me at 202-973-4281.

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OTH

Sincerely,

Maria T. Browne
John D. Seiver

Enclosures

CERTIFICATE OF SERVICE

I hereby certify that a true copy of the foregoing *Direct Testimony of Michael T. Harrelson* on behalf of *Florida Cable Telecommunications Association, Inc.* was furnished by regular U.S. mail, on this the 7th day of September, 2007 to the following:

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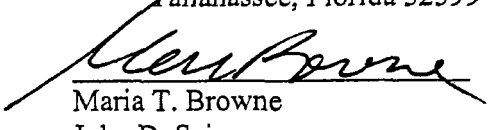

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BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

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

DIRECT TESTIMONY OF MICHAEL T. HARRELSON ON BEHALF OF FLORIDA CABLE TELECOMMUNICATIONS ASSOCIATION, INC.

SEPTEMBER 7, 2007

I. 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 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 carrier 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, it 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..

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 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 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 calculated 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. The matter is now on appeal.

I also participated in the Florida Public Service Commission ("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 I 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, 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 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. Are 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 2007-2009 Storm Hardening Plan (the "Plan") filed by Tampa Electric Company ("TECO" 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 the NESC's 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. 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 existing cables that would delay provisioning of service to customers, and no 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 cable operators are 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 service to 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 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 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 IOU's service territory, and that 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.

Company Plan

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

A. Yes I have.

Q. Have you reviewed the Direct Testimony and Exhibits of the Company's witness, Regan B. Haines, 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. Second, certain aspects of the Company's deployment strategy are not prudent, practical or cost-effective. Third, certain of the third party attachment standards and procedures set forth in the Plan do not relate to storm hardening but instead are rates, terms and conditions 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 input from third party attachers. However, this last point I believe is

remedied by the Process to Engage Third Party Attachers, attached as MTH-3, that has been agreed to by TECO, FCTA and the other IOUs and third party attachers filing in this and related storm hardening plan dockets.

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), F.A.C.?

A. Rule 25-6.0342, F.A.C., concerns strengthening poles to withstand extreme weather conditions produced by hurricanes—i.e., extreme wind. The relevant NESC rules are those that address loading and the effect of wind on the poles which 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, are not at issue in this proceeding. TECO 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 F.A.C. 25-6.0342(3)(a). *See, e.g.*, Plan at 7 ("A basis of Tampa Electric's construction standards, policies, practices and procedures is the NESC...Tampa Electric's construction standards and policies meet or exceed all minimum NESC clearance requirements."), 23 ("The 133 mph wind standard [applied to all 230 kV structures throughout Tampa Electric's service area] exceeds the NESC requirements for extreme wind loading.")

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 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 an "equivalent wind" strength of approximately 116 mph, and is thus "stronger" than Grade C design, which results in an "equivalent wind" strength of approximately 86 mph. The NESC generally requires Grade C construction for "distribution" lines. Grade B is required for distribution poles crossing over railroad tracks, limited-access highways, and navigable waterways requiring waterway crossing permits. TECO states in its Plan that the Company utilizes NESC Grade B loading criteria as the basis for its construction standard for all new construction, major planned work, expansions, rebuilds and relocations of the overhead distribution system. According to TECO, the NESC Grade B criteria provide for a system that is twice as strong as the NESC Grade C criteria. Plan at 14. I will discuss later that Grade B does produce construction stronger than Grade C but not twice as strong, and that much of the TECO distribution system is not presently built to Grade B standards. Nonetheless, TECO's distribution facilities already meet, and in most cases exceed, the minimum 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. The Company's Plan states that the Company intends to harden three circuits feeding two "critical" customers on the company's system (St. Joseph's Hospital and the Port of Tampa) to EWL criteria as part of a pilot program set up to evaluate the benefits of utilizing the NESC EWL requirements on the distribution system. Plan at 20, 37-39. The Company refers to this as its Extreme Wind Pilot Project. *Id.*

Q. Is the Company's decision to adopt NESC EWL criteria only for limited pilot projects prudent, practical and cost effective?

A. Yes. First, I agree with TECO's overall conclusion that EWL is not the right construction criteria to apply throughout its service territory. Second, I agree that it is prudent and cost effective to pilot EWL criteria as a construction standard on two of TECO's most critical circuits. *See* TECO's Resp. to Staff's First Set of Interrogatories ("Staff's Interrog.") No. 4.

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

A. TECO has stated "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." Plan at 15. I agree that the benefits of applying EWL criteria to poles 60 feet and less in height are speculative at best. There are also negative consequences to having stronger, more numerous and more costly poles in a line.

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.

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.

Indeed, other expert witnesses filing testimony on behalf of Gulf Power and Progress Energy Florida ("PEF") 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 Power 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 Power's experience is that wind-blown debris is the predominant cause of damage versus pure wind." Battaglia Test. at 15. 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. Lastly, 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.

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, attached as MTH-2, in which he opined that the application of EWL to distribution poles is not prudent or cost effective. Slavin Aff. § 3.1. 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.

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. Please explain why you think TECO's pilot project approach is prudent, practical and cost effective?

A. First, the approach focuses on two of TECO's most critical circuits—the Port of Tampa where much of Florida's gasoline supply is received and St. Joseph's Hospital, which it states would have delayed restoration without storm hardening following an extreme weather event. TECO's Resp. to Staff Interrog. No. 26. Second, TECO appeared to

consider topography and wind effects when selecting these projects. For example, it states that St. Joseph's Hospital was chosen in part because of its "high elevation," and thus, greater exposure to wind and less exposure to flooding. Plan at 39. Whether a particular location is more susceptible to extreme wind conditions—such as open areas, near the coast—is an important factor to consider before apply EWL criteria. Third, the planned expenditure on these projects over the next three years is $1.3 million, Plan at 41, TECO's Resp. to Staff Interrog. No. 4, and it will harden 7 miles of plant with these projects. TECO's Resp. to Staff Interrog. No. 9. TECO includes two other storm hardening projects which I consider EWL projects: the Tampa Airport project in 2008 (Plan at 35) and Hardening of Interstate Crossings (Plan at 35-36). Together these projects cost $1.4 million. Plan at 41. FCTA has no objection to these projects. TECO's EWL projects will cost approximately $2.7 million including the Airport and Interstate crossing projects. I believe this represents a balanced plan to concentrate on the fundamental proven storm hardening initiatives of vegetation management, pole inspections and remediation of rotten and damaged poles and guys versus experimenting with the possible benefits and disadvantages of EWL design. TECO estimates $80.1 million will be spent on storm hardening in three years. *Id.* The EWL projects equal 3.4% of the cost of the three-year plan. *Id.* As TECO states in its answer to FCTA's First Set of Interrogatories Item No. 8, "the company estimates that very few incremental poles will be added as a result of its storm hardening activities ... the company's experience shows that overloaded poles are corrected by means other than adding additional mid-span poles." Fourth, TECO's pilot project approach will allow the company to monitor and analyze the performance of EWL criteria to determine whether it is justified for critical infrastructure. Fifth, TECO appears appropriately to have based its decision in part upon "data from the 2004 and 2005 storm

seasons that provide actual costs incurred and the duration of those outages." TECO's Resp. to Staff Interrog. No. 30.

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, TECO states that it will continue to use Grade B criteria in these instances. Plan at 14 ("the NESC Grade B criteria provide for a system that is twice as strong as the NESC Grade C criteria which results in a robust design that the company's experience has shown to provide safe, reliable and cost effective service."). In its answer to Staff Interrogatory No. 7, TECO defends its rejection of EWL in favor of Grade B stating its decision was "based on a 150 year historical record from the National Oceanic Atmospheric Administration ("NOAA") Coastal Service Center during which the maximum sustained wind experienced was 115 miles per hour. The NESC wind maps covering TECO's territory ranges from 100 miles per hour in the eastern edge to 120 miles in the western edge. Construction Grade B has an effective wind speed of 116 miles per hour which the company believes is sufficient for its territory."

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. In my opinion, Grade B is more than adequate to strengthen distribution poles against the effects of extreme wind. Compliance with the applicable grade of construction required by the NESC—which is Grade C 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, and replacing rotten poles—are implemented. However, TECO, since the early 1970's, has used Grade B construction criteria and the majority of its plant already is built to Grade B. Accordingly, TECO estimates the incremental cost of continuing to build to Grade B to be zero. *See* TECO Cost Benefit Matrix, Document 2 of Exhibit RBH-1. Based upon TECO's historic use of Grade B construction, continuing to build to Grade B standards with only limited pilot projects for EWL is a prudent, practical and cost-effective approach.

However, as set forth below, I do have concerns about how TECO plans to deploy its construction standards.

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 in Section 7 of the Company's Plan. Plan at 26-43. TECO's deployment strategy includes: (1) implementation of Grade B construction standards for distribution structures and extreme wind, Grade B, for

transmission structures; (2) various maintenance programs, including pole replacements made as a result of the ground line inspection required in FPSC Docket 060078-EI; (3) other storm hardening initiatives; and (4) a three year pilot project program for testing EWL standards on select distribution facilities serving two critical customers.

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

A. First, the Plan does not include the specific technical design specifications, construction standards and construction methodologies that will be employed by the Company in hardening poles. Indeed, in response to Staff's Interrogatory No. 31 concerning the assumptions third party attachers should use in estimating the cost impacts from TECO's Plan, TECO states that "these projects are in the preliminary stages of planning and have not been fully engineered." TECO proposed to conduct follow-up discussions and meetings with attachers concerning these details. TECO also has committed to adopt a Process To Engage Third Parties, attached hereto as MTH-2, pursuant to which it intends to provide updated information about the specific design specifications and construction methodologies it will be employing on an annual basis. This should remedy some of the current lack of details in the Plan.

Second, the Plan originally did not indicate the joint use poles that would be impacted by storm hardening projects. However, TECO subsequently provided this information in response to Staff Interrogatory No. 33. This information is very useful to cable operators for planning and budgeting purposes. When this information is supplemented with the actual engineering drawings that identify the location of each pole and specify whether the pole will be replaced or relocated, cable operators can provide the level of input required by the rule. TECO's Plan should be amended to include this information.

Third, the Plan does not adequately identify the costs and benefits of its proposed Plan on third party attachers. However, the approximate cost to attachers can now be provided based on the joint use pole count recently provided by TECO in discovery and the information provided in response to Staff Interrogatory No. 33 discussed above.

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 an annual basis by project. 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 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 conclude at this time whether it is sufficient to enable third parties to determine their costs.

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

A. The Process agreed to by TECO and FCTA for continuing the dialogue, set forth in MTH-2, that includes reasonable advance notice to, and a process for incorporating feedback from, third party attachers, goes a long way toward alleviating my concerns about the level of required detail that currently is missing from TECO's Plan.

Q. Does the Company's deployment strategy meet the overall objective of enhancing the reliability of the electric distribution and transmission system in a prudent, practical and cost-effective manner?

A. In some respects yes, and in others, no.

Q. In what ways does TECO's deployment strategy meet the Commission's overall objective?

A. As set forth above, TECO's three year pilot project program for testing EWL standards on select distribution facilities serving two critical customers is a prudent, practical and cost effective means of evaluating whether such upgrades will improve reliability and reduce restoration costs. I also do not have a problem with most of the other storm hardening initiatives being undertaken by TECO, including its plans to upgrade a transmission segment feeding the Skyway substation, conversion of its remaining 4kV circuits, its planned pressure testing of 18 network protectors located in 10 low lying manholes and vaults in the downtown area, undergrounding interstate highway crossings, and sampling system damage following a major weather event in a statistically singificant manner—these are prudent, practical and cost-effective methods of ensuring reliability and reducing storm restoration costs and outage times. While I agree in concept that inspection and maintenance programs can be a useful deployment strategy for storm hardening, I am very concerned that TECO will use its inspection and maintenance programs to unfairly shift

blame and with that blame certain hardening costs to third party attachers. I am also concerned about TECO's plans for deploying Grade B criteria.

Q. Please explain your concerns about TECO's deployment strategy.

A. First, while I am not opposed to TECO's decision to continue using Grade B criteria, I do not believe that its current plans for deploying Grade B are prudent, practical or cost-effective. Specifically, I do not agree with TECO's stated intent to use Grade B criteria for assessing non-compliance for all existing poles. *See* TECO's Resp. to FCTA First Set of Interrogatories Item No. 18 ("All poles on the company's distribution system will be evaluated using NESC Grade B criteria when pole loading analysis is performed for all company and third party attachments."). This will result in TECO replacing sound poles built to Grade C construction criteria—i.e., replacing NESC compliant poles—with poles meeting Grade B criteria. This is not prudent, practical or cost-effective. TECO began using Grade B construction in the early 1970's. TECO's March 2, 2007 reliability report ("Report") shows that TECO has 304,030 wood distribution poles. Of 17,700 poles inspected in 2006, 4751 were of vintage 1970 and earlier back to 1932. *See* Report at 146. If that inspection is typical of TECO's distribution poles, the logical deduction is that 27% were installed before TECO began using Grade B construction. NESC Rule 013.B and Rule 25-6.0345, F.A.C., state that facilities which comply with the rules that were in effect when they were installed remain in compliance.

TECO still is in the process of upgrading its system to Grade B including as many as 27% of 304,030 poles or 82,000 plus poles. It is practical, prudent, and cost-effective to upgrade this significant number of poles but only as they genuinely need to be replaced. They should be evaluated against Grade C standards based on the vintage date being 1970 or earlier as determined during the next six years of scheduled ground line inspections. It is obvious that TECO's system is not actually up to Grade B standards. The cost

spreadsheet regarding TECO storm hardening plan, TECO Cost Benefit Matrix, Document 2 of Exhibit RBH-1, shows wood pole inspection costs to TECO will increase 450% for 2007-2009, compared to 2004-2006. TECO has been doing very few pole inspections until recently. Of the 17,700 inspected in 2006, 1359 failed to meet Grade B strength criteria, resulting in a failure rate of 7.7%. 1500 more failed a screening test for Grade B loading, or an additional 8.5%. *See* Report at 147. A pole inspection failure rate of 15% is completely inconsistent with a Grade B compliant system. With all of the expense TECO is budgeting for distribution pole replacements, approximately $6 million per year in 2008 and 2009, it would be prudent to accelerate the replacement of rotten and damaged poles and wait to replace the sound Grade C poles on the next inspection cycle, if at all. *See* Plan at 41.

Second, TECO's Plan relies heavily on its "maintenance programs" including its Groundline Inspection Program by which it intends to identify poles that need to be replaced. *See* Plan at 29. This inspection program was required by Order No. PSC-06-0144-PAA-EI, issued February 26, 2006 in Docket No. 060078-EI. In satisfying this requirement, TECO states that it will conduct a loading analysis and data collection on poles having third party attachments that "will ensure that the condition of the pole meets the requirements in Table 261-1A of the NESC and Tampa Electric Construction Standards." Plan at 28. While I agree that pole inspections can be a cost effective means of identifying rotten and overloaded poles, I have serious concerns about the reasonableness of (1) the factors being considered by TECO in the loading analysis it is using to determine whether a pole exceeds the applicable loading criteria; and (2) the methods being employed by TECO to assign responsibility and resulting correction costs to third party attachers.

Q. Please explain your answer.

A. In addition to the high failure rates mentioned above, the planned Grade B strength assessment of all joint use poles is not practicable or justified as proposed by TECO. All joint use poles failing a visual assessment will undergo a second, much more costly loading study, again at Grade B, regardless of the age of the pole. All cable attachments approved by TECO must have met the applicable standard used by TECO at the time most of the system was installed in the 1980's. TECO states that loading calculations will be conducted as part of the pole inspection program on any joint use pole to ensure that each pole is not overloaded or approaching overloading. Plan at 42. First a preliminary stress test will be conducted by a contractor. "The simplified load analysis shall determine the pole strength required for compliance with the NESC for Grade B Construction for Combined Ice and Wind (Light Zone) and Extreme Wind Loading" and "shall consider all pole attachments ... and ... line angles associated with each attachment." TESS 1.01 Pole Inspection Program at 6-7 (included as part of TECO's Resp. to FCTA Req. for Prod. of Docs. No. 22). Poles failing that preliminary test will then be subjected to a "comprehensive pole loading analysis." Plan at 42. When asked, TECO declined to share details of the visual inspection criteria or the results of the "comprehensive analysis" of 2500 poles which they are completing in 2007. *See* TECO's Resp. to FCTA First Set of Interrogatories Item Nos. 25, 27. The failure rate of the visual inspections for 2006 was 8.5% or 1500 poles, if all inspected poles were joint use which they were not. Without the opportunity to know what the guidelines for visual inspection screening or the results of the follow-up comprehensive analysis, I can only say that the percentages appear to be unreasonable and likely will result in significant added costs to remedy the "failures" that will be passed on to third-party attachers on the joint use poles. I strongly object to the approval of this plan until the required information has been provided by TECO and evaluated by FCTA.

TECO plans to use PoleForeman pole loading analysis software to perform its comprehensive pole loading analysis. TECO's Resp. to Staff Interrog. No. 1. I am concerned that PoleForeman may not take into account all of the relevant criteria for assessing the true strength of the pole and it s ability to withstand wind and 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 TECO 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 B standards.

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

A. No. To my knowledge, Mr. Haines has made no commitment 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 or verifying that they are included in its consideration of the strength of a given pole. As a result many poles strong enough to meet Grade B or even EWL may be changed out unnecessarily by TECO at great expense.

Q. Do you have any other concerns about TECO's ground line inspection program?

A. I am also concerned that TECO will use the inspection process to shift unfairly the costs of storm hardening to third party attachers.

Q. What is the basis of this concern?

A. First, TECO only intends to perform a loading analysis on joint use poles. TECO's Pole Inspection Program guidelines state that "A load analysis shall not be performed on poles with only Tampa Electric assets." Section 8.06.04 at 6. This approach is discriminatory. In my experience, the electric company facilities place the most significant load on the pole. See my discussion below pertaining to overlashing.

Second, TECO intends to assess responsibility for overloading the pole in a discriminatory and arbitrary manner. TECO states that it will presume that the electric company was the first entity on the pole. *See* TECO's Resp. to FCTA First Set of Interrogatories Item No. 22 ("It is always assumed that the company was the first attacher"). It will then attempt to assess responsibility for overloading on the last party on the pole, which it presumes to be a third party attacher. In my experience, the power company pole owner is often the last one to put an attachment on a pole. While TECO obviously must place the pole first and almost always install the first lines and some facilities on the poles, power companies add and rearrange facilities and equipment on a daily basis as do the other attachers. The cable systems were initially installed in the 1980's and almost all of the poles in Tampa are likely to have been modified in some way

since that time. The presumption that TECO was first and therefore caused no overload or violation of the NESC is completely unreasonable.

Third, TECO intends to assess responsibility for overloading on any party that cannot produce "an approved application." TECO's Resp. to FCTA Set of Interrogatories Item No. 22; Plan at 42. TECO has asserted that it has not maintained adequate records of pole attachments. Accordingly, it will look to third party attachers to prove that they are authorized to be on the pole. If they cannot produce evidence that they are authorized—in the form of an approved application—they will be held responsible for any non-compliance and will be "responsible to pay for the make-ready that will bring the pole back into compliance" or required to remove the attachment. *Id.* "Existing attachments that do not have approved applications from the company will be accessed [sic] cost responsibility for correcting any compliance issues." TECO's Resp. to FCTA First Set of Interrogatories Item No. 26; Plan at 42. However, third party attachers also often have inadequate paper records of authorizations. This is the result of the fact that many attachments were made decades ago, and the system ownership has changed hands many times since the attachments were made. This does not mean that a loading determination was not performed by the attaching entity or TECO at the time of attachment. In fact, it is standard industry practice to conduct a pre-construction engineering ride out and assess the impact of the attachment of the pole. If the new attachment would bring the pole out of compliance, then work is performed—at the cost of the attacher—to make the pole ready for its attachment (i.e., compliant with governing separation and loading criteria). If third-party attachers pay make-ready at the time of attachment it would be double charging to now assess third-party attachers with additional costs of compliance.

Moreover, despite the availability of paper copies of "approved applications," TECO is well aware of the third party attachments to its poles and third party attachers

have been paying rent on the attachments for years. In fact, TECO conducted an audit of its attachments in 2001 during which time it "trued-up" its records with cable operator attachers. As a result of the audit, cable operators paid a significant lump sum to cover back rent for attachments which TECO claimed were not authorized. TECO did not issue new "approved applications" for these attachments. Yet, now it claims that, notwithstanding the fact that it knows about the attachments, and the cable operators have been paying rent for these attachments, if the operator cannot produce a paper record of the original approved authorization, it will be presumed to be the cause of any pole overloading or other violation of TECO attachment standards. In my opinion, this is completely unfounded and unfair, especially in light of the fact that cable operators' load on the pole really is not large compared to the load caused by the pole owner.

Q. Does TECO's transmission pole maintenance program affect third party attachers?

A. Yes, because a great many of TECO's wood transmission poles are located along city streets where distribution power lines and cable television operators are attached to the transmission poles and intermittent distribution poles. These are known as joint transmission and distribution poles. Various cables of different third parties must be considered by TECO in the design and construction of upgrading these wood poles to concrete or steel. It is important for all parties involved to work together effectively. *See* Plan at 31-32.

Third Party Attachment Standards And Procedures

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

A. Yes. TECO attachment standards and procedures included in its Plan require compliance with the NESC. *See, e.g.*, Plan at 43-49.

Q. Do the third party attachment standards and procedures comply with the requirements of Rule 25-6.0342(5), F.A.C., i.e., do they 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?

A. No.

Q. Why not?

A. First, TECO includes certain terms and conditions governing third party attachments that are not related to 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 third party attachment standards and procedures do not assure as far as reasonably practicable that third party attachments do no impair electric service reliability, overload the pole or are constructed in accordance with accepted industry standards, and therefore should not be approved.

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

A. The sections of the Plan for which TECO seeks approval include: Section 8.1, pertaining to the Company's requirement that attaching entities have an agreement; Section 8.2, pertaining to the permit application procedure, which specifically includes permitting for overlashing; Section 8.4.1, concerning the timeframes for remedying non-compliance with TECO's construction standards; Section 8.5, which requires third party attachers to communicate using the National Joint Utility Notification System (NJUNS) and to have an NJUNS account; Section 8.7, which concerns the eight year wood pole inspection requirement, including the loading analysis TECO plans to conduct inspections of third

party attachments; and Section 8.8, which concerns TECO's joint use pole attachment audit, which is really just a billing audit pursuant to which TECO reserves the right to true-up its pole attachment count and back bill to the last audit and assess unauthorized attachment fees. In my opinion, only those provisions that concern the loading impact of third party attachments on the pole relate to storm hardening and are appropriately included in the Plan and should be considered in this proceeding. The remaining 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 TECO's attachment standards and procedures address the loading impact of third party attachments on the pole and thus, concern storm hardening?

A. Only two subparts of Section 8 concern storm hardening: Section 8.7, which pertains to "stress" calculations that will be conducted on joint use poles as part of TECO's ground line inspection to ensure that each pole is not overloaded or approaching overloading, and Section 8.3, which requires permits for new attachments and overlashing. *See* TECO's Resp. to FCTA First Set of Interrogatories Item No. 20 (justifying its requirement of notification and prior approval for overlashing because "it is reasonable to expect notification by third parties when they are placing additional load on our facilities. It is also reasonable to expect that the company facility in question has been evaluated to ensure it is strong enough to accommodate the third party attachment.").

Q. Are the provisions in Section 8.7 of TECO's attachment standards and procedures reasonably practicable?

A. No. TECO's requirements in Section 8.7 are not. I have serious concerns about the stress calculations that TECO plans to conduct on joint use poles. These are as follows. First, TECO intends to conduct one set of "stress calculations" on any joint use pole during its eight-year distribution and six year transmission pole inspection program. TECO to date will not inform FCTA of the details of this initial "stress calculation" even though it presumably has completed those in 2006 on 1500 distribution poles. *See* TECO's Resp. to FCTA First Set of Interrogatories Item No. 24. Second, I do not know whether TECO's stress calculations will appropriately take into consideration the guying effects of lateral lines, crossing lines, cables and guys on the poles. Third, the inspection is discriminatory because TECO is not applying the same stress calculations to poles with only TECO attached. Not only is this discriminatory, it is poor maintenance practice to send trained personnel to do a piecemeal inspection. Power-only poles certainly become overloaded for a wide variety of reasons, including the power company's addition of facilities and need to repair storm damage and corrosion to critical components such as guy wires.

In 2006, TECO "flagged" 1500 poles for a "comprehensive pole loading analysis." TECO has completed the field work and is reviewing the results before discussing the audit's scope and methodology. *See* TECO's Resp. to FCTA First Set of Interrogatories Item No. 25. Apparently FCTA will learn details of this highly secretive initial audit after the hearing. Many of the assessments TECO intends to make on third parties for cost of the audit, determining responsibility for overloading, and even the method of calculating the loading are not subject to FPSC jurisdiction. They do, however, have a great potential impact on the cost of storm hardening for third party attachers. For all these reasons I cannot conclude that TECO's attachment standards and procedures in Section 8.7 are reasonably practicable

Q. Are the provisions in Section 8.3 of TECO's attachment standards and procedures requiring permits for overlashing reasonably practicable?

A. No.

Q. Please explain your answer.

A. Certainly. Let me begin with a description of overlashing. 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. 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 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. 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.

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. Has TECO always required prior notice or prior approval for overlashing?

A. No, as TECO explains in its answer to FCTA First Set of Interrogatories Item No. 20, "the company has allowed cable operators to provide notice after the fact for overlashing in the past under the premise that the last admitted and known attacher to the poles in question is accepting responsibility for any violation of the company's construction and loading standards that are found on the poles during the inspection of the attacher's application." Significantly, TECO has provided no records of poles failing because of overlashing.

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.*

Q. Do you have other concerns about TECO's requirement of permits for overlashing?

A. Yes. 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. Rule 25-6.0342(8) provides that "Nothing in this rule is intended to conflict with Title 47, United States Code, Section 224, relating to Federal Communications Commission jurisdiction over pole attachments."

Q. Do you have other concerns about TECO's policies regarding third party attachers?

A. Yes. As set forth above, I have well founded concerns about how TECO intends to implement the loading and strength assessments on third party attachments in its ground line inspection program, which is includes as an integral component of its overall Plan.

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 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. TECO provided useful pole attachment count information for EWL and storm hardening projects in its answer to Staff Interrogatory No. 33.

The cable operators did provide specific feedback concerning the Company's attachment standards and procedures for third party attachments. Specifically, cable operators pointed out the overly broad scope of the Company's attachment standards and procedures, the ways in which the standards and procedures conflicted with FCC precedent, and the fact that certain standards were not reasonably practicable, prudent, practical or cost effective. FCTA asked for more information which was partially provided. FCTA also asked for deployment and implementation changes which were not.

Q. Has that situation changed recently?

A. Yes. 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 TECO, 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.

CURRICULUM VITAE
M. T. (MICKEY) HARRELSON

M. T. (Mickey) Harrelson
P. O. Box 432
McRae, GA 31055

Phone: (912) 568-1504
Cell: (229) 860-1300
Fax: (912) 568-1502

Registered Professional Engineer (Electrical) GA#10724 (1976)
Registered Professional Engineer (Electrical) FL #51788 (1997)

EDUCATION: B.S. Industrial Engineering (Co-op) GA TECH, 1970

WORK EXPERIENCE:

1959-	Worked part-time with Harrelson Electric Co., owned by my father.
1963	W. T. Harrelson, doing residential, commercial, & industrial electrical and repair work in McRae, GA.
Dec. 1963- Mar. 1970	Co-op student of Georgia Power Co. in Electric Distribution Operating, McRae, GA, & Commercial Sales, North Atlanta.
Apr. 1970- Jan. 1972	Lieutenant in U. S. Army Air Defense, Minneapolis, MINN, & Yong Son, KOREA. Served as Battery Commander, Korea. Military Status: Inactive, Army Reserves; Rank: Captain.
Feb. 1972- June 1974	Operating Engineer, Brunswick, Georgia Power Co.; Designing, operating, and maintaining distribution system and operating transmission system.
June 1974- Feb. 1976	Senior Commercial Marketing Engineer, Brunswick. Selling wise use of electricity to new and existing commercial customers in Brunswick area. This included lighting design to I.E.S. standards, and consultations regarding the National Electrical Code.
Feb. 1976- June 1978	Operating Engineer, St. Simons Island, Ga. Power; Designing, operating, & maintaining distribution system & operating transmission system.
June 1978- May 1986	District Engineer; Supervised engineering and operation of Brunswick District of Ga. Power Co., including Kingsland Operating Headquarters.

May 1986-Sept. 1989 — Area Manager, McRae, Ga. Power Co; Restructure McRae, Eastman, Hazlehurst into area operation, and supervise and coordinate all company activities in the area.

Sept. 1989-April 1992 — District Power Delivery Manager, Milledgeville District; Manager of Engineering, Construction, & Maintenance of the electric distribution system and operation of the transmission & distribution system.

Note: During 28 years with Georgia Power Company, I was involved with claims, damage and accident investigations. From 1978 through 1992, I was in charge of these activities at my location.

April 1,1992 — Resigned from Georgia Power Company, Reason for leaving: Early retirement incentive package gave excellent opportunity to pursue independent consulting engineer goals.

April 1,1992 to present — Electric Utility Consulting Engineer.
Investigated accidents and testified in matters involving the National Electrical Safety Code, OSHA regulations, utility company safety manuals, employee training courses, accepted good work practices, and the National Electrical Code. These cases have involved electrical contact, flash, and burn injuries, collisions with poles and guy wires, falls from poles, etc., hydraulic oil fires, crushing injuries, property losses from fires, stray voltage, etc. The companies involved have been electric, telephone, cable TV, and product manufacturing companies.

I do management consulting and safety and engineering training for electric cooperatives, engineering consulting companies and private industry

I do electric power line inspections for electric cooperatives as required by the Rural Utility Service.

I inspect power lines and communications lines built jointly for National Electrical Safety Code compliance. I teach N.E.S.C. compliance and train field engineers and technicians in joint use compliance. I assist CATV, Power, and Telephone companies in interpreting the NESC and applying its rules to joint use of utility poles.

OTHER COURSES AND SEMINARS:

1974 — 13 weeks Commercial Sales Training by Ga. Power Co., including interior & exterior lighting design, & National Electrical Code.

1975 — 1 week General Electric Outdoor Lighting School, Hendersonville, NC.

1976 — 8 weeks Electric Operations Training by Ga. Power Co.

1977	1 week Principles of Leadership Training, Ga. Power Co.
1979	1 week Basic Management Training by Ga. Power Co.
1980-1985	Served as "Leader" of Engineering Dept Quality Circle.
1981	1 week Communications-General Training by Ga. Power Co.
1982	1 week Human Relations Skills Training by Ga. Power Co.
1987	3 days Interpersonal Skills Seminar by Ga. Power Co.
1988	1 week Management Grid School, Mobile, AL, Training by Southern Co.
1988	13 weeks Community Leadership Class sponsored by University of GA Cooperative Extension Service and Telfair County.
1989	1 week Negotiating Edge Seminar, Athens, GA., Training by Ga. Power Co. and Susan Wise
1989	Basic Economic Development Course, GA Institute of Technology
1990	3 months- Committee assignment (met bi-weekly) to formulate Ga. Power Company Guarantee Policy
1991	6 months-Committee assignment (met bi-weekly) to develop "District Operations Performance Measurement" facilitated by Ernst & Young Co.
1991	3 months-Committee assignment (met bi-weekly) to assess Georgia Power Company Marketing Dept Readiness for Incentive pay.
1992	1 week advanced Negotiating Skills Seminar, Peachtree City, Training by Ga. Power Co. & The Executive Speaker, Inc.
1992	1 day IEEE Seminar on 1993 National Electrical Safety Code
1993	2 day NRECA Safety Accreditation Team Training & Testing Seminar
1994	3 day Seminar-The Development & Application of the National Electrical Safety Code by Allen Clapp
1995	2 day ILCI (International Loss Control Institute, Inc.) Seminar on accident investigation
1996	1 day IEEE Seminar - "Changes in me 1997 NESC."
1997	3 day Seminar - "Application of 1997 NESC."

MEMBERSHIPS AND AFFILIATIONS:

1970-present	Member, Georgia Tech Alumni Association
1974-present	Member, Georgia & National Society of Professional Engineers
1978-1986	Member, Glynn County GA Electrical Inspection Board
1992-present	Member, Telfair Co. Chamber of Commerce
1992-present	Member, Institute of Electrical & Electronics Engineers (IEEE)
1993-2002	Board Member, Telfair County Industrial Development Authority

1993-2002	Member, Illuminating Engineering Society of North America (IECNA)
1993-present	Rural Electric Safety Accreditation Program (RESAP) certified accreditation inspector
1994-present	Member, National Fire Protection Association

TESTIMONY BY MICHAEL T. HARRELSON, P. E.

1. 5-2006 to 8-2007 **Florida Public Service Commission for FCTA**
Michael Gross Attorney — Written comments and
Maria Browne, Attorney — verbal comments
Beth Keating, Attorney

2. 4-27-06 & 5-1-06 **FCTA, et. al vs. Gulf Power Company Before the FCC**
Testimony

John Seiver
Cole, Raywid & Braverman, L.L.P.
1919 Pennsylvania AVE, NW – Suite 200
Washington, D.C. 20006

3. 3-31-06 **FCTA, et. al vs. Gulf Power Company Before the FCC** — Written Testimony

John Seiver
Cole, Raywid & Braverman, L.L.P.
1919 Pennsylvania AVE, NW – Suite 200
Washington, D.C. 20006

4. 3-16-06 & 3-21-06 **FCTA, et. al vs. Gulf Power Company Before the FCC** — Deposition Testimony

John Seiver
Cole, Raywid & Braverman, L.L.P.
1919 Pennsylvania AVE, NW – Suite 200
Washington, D.C. 20006

5. 3-13-06 **Comcast of Arkansas v. Entergy Arkansas Before the FCC** — Deposition Testimony

John D. Thomas
Hogan & Hartson LLP
555 Thirteenth ST, NW

Washington, D.C. 20004

6. 4-16-05 **Louisiana Public Service Commission** Written Testimony

For LCTA

John D. Thomas
Cole, Raywid & Braverman, L.L.P.
1919 Pennsylvania Ave., NW - Suite 200
Washington, D.C. 34358

7. 2-15-05 **CTA Arkansas vs. Entergy** FCC Written Testimony

John D. Thomas -- *for Plaintiff*
Cole, Raywid & Braverman, L.L.P.
1919 Pennsylvania Ave., NW - Suite 200
Washington, D.C. 34358

8. 1-10-05 **Clinton vs. Florida Keys Electrical Cooperative, Inc.** Deposition & Trial

Sixteenth Judicial Circuit Court in and for Monroe Co., Florida

Eric Peterson -- *For Defendant*
Peterson Benard
P. O. Drawer 15700
700West Palm Beach, FL 33416

H. Clay Roberts -- Plaintiff
Proenza, Roberts, Hurst, P.A.
2900 W 28th Terrace, Suite
Miami, Florida 33133

9. 12-03-04 **MEAG vs. Goodman** Testified at Hearing

Mr. Robert Wilmot -- *For Plaintiff*
P. O. Draw 1287
Tifton, GA 31793

MEAG Power Company right-of-way encroachment suit to clear transmission line

right-of-way of mobile homes.

10. 10-22-04 **Caldwell vs. Howard Industries, No. 4:03-cv-198-3**
Deposition

United States District Court, Middle District of Georgia, Columbus Division

Lester Tate -- *For Plaintiff*
Akin & Tate
P. O. Box 878
Cartersville, GA 30120

William T. Mitchell, Defense
Cruser & Mitchell, LLP
3500 Parkway Lane
Norcross, GA 30092

11. 6-23-04 Comcast Cable vs. Pacificorp
Deposition

Angela W. Adams -- *For Claimant*
Ballard Spahr Andrews & Ingersoll, LLP
One Utah Center, Suite 600
201 Main Street
Salt Lake City, Utah 84111-2221

12. 6-8-04 Saffold vs. Aldrich Rent-All
Deposition

Heather B. Bush -- *For Defendant*
Peterson Bernard
1550 Southern Boulevard, Suite 300
West Palm Beach, Florida 33416

13. 9-04-03 Perkins v. Georgia Power Company and Altec
Deposition

Attorneys Langston Bass and Hugh McNatt
Defendant
State Court Candler Co., GA

Contractor Lineman contacted 27,000 volts hand-to-band. He was not wearing rubber gloves. He lost both arms. He sued Altec for inadequate bucket truck design and GA Power for inadequate planning and supervising of work. *Settled out of Court.*

14. 5-02-03 McKeown v. CHELCO, et al Deposition & Trial

Attorney Alan E. Horkey -- *For Defendant*
700 S Palofex Street, Suite 170
Pensacola, Florida 32501
Circuit Court, Walton Co., FL

A teen-aged boy hit power pole with pick-up truck in rain on a curve. He had a severe head injury. He sued electric co-op, claimed they should have moved the pole since it had been hit twice before. Pole location complied with code and DOT guidelines. *Jury verdict gave court cost only to plaintiff.*

15. 11-09-01 Duffie vs. Clay Electric Co-op & Cox Cable et al Deposition & Arbitration

Attorney Craig Cooley -- *For Defendant*
200 East Robinson Street, Suite 555
Orlando, Florida 32801
Circuit Court Alachua Co., FL

A motorcycle rider hit a power line which fell across a U. S. Highway. A contributing factor was that a Cox Cable anchor had been improperly installed. This allowed a Clay

Electric Co-op pole to break in four pieces. *Settled at arbitration by Clay, Cox and two Cox sub-contractors.*

16. 12-13-00 Darley vs. Amusements of America, Inc.
Deposition

Attorney Robert R. Gunn -- *For Defendant*
P. O. Box 1606
Macon, GA 31202
State Court, Bibb County, GA

A young man got electric shock when he took hold of a metal rail on the platform of an amusement ride. *Settled*

17. 11-21-00 Causey vs. Okefenoke REMC
Deposition

Attorney Mark Barber -- *For Defendant*
136 N Fairground Street, Suite 100
Marietta, GA 30060
Superior Court, Brantley Co., GA

An onlooker was killed by burning transformer oil. He was watching a lineman attempt to stop an oil leak when the explosion and fire occurred. *Settled*

18. 10-18-00 Malin vs. McElmurray & Oellerich Electrical Service Deposition & Trial

Attorney David Bell -- *For Plaintiff*
P.O. Box 1011
Augusta, GA 30903
Superior Court, Richmond Co., GA

A young man was killed while cleaning pipes in a milking barn when he touched a light fixture which was not grounded. *Jury verdict for $1,000.000.00*

19. 10-04-00 Moses vs. Bill's Dollar Store, et al Deposition & Trial

Attorney David Bell -- *For Plaintiff*
P.O. Box 1011
Augusta, GA 30903
State Court, Gwinnett Co., GA

A gas company employee was killed when he touched a metal rack which held an air conditioning unit. The unit was not grounded. *Settled*

20. 1-25-00 Byrd vs. Glades Electric Co-op
Deposition

Attorney Robert Swartz -- *For Defendant*

Ft. Lauderdale, Florida
Circuit Court, Glades Co., FL

A flatbed truck crane operator was killed when he put the steel cable into a 7200-volt line. He jumped clear of the truck, then attempted to get in the cab and was electrocuted. *Settled.*

21. 9-10-99 Scruggs vs. Georgia Power Company
Deposition

Attorney Rowland Dye -- *For Defendant*
P. O. Box 2426
Augusta, GA 30903
State Court, Georgia

A truck hit a low power line service which had been previously hit by an over-height load of hay. *Settled.*

22. 3-12-97 Price vs. City of Thomasville Deposition
& Trial

Attorney Hugh McNatt -- *For Defendant*
Vidalia, GA
Federal Court, Albany, GA

A contractor lineman was badly burned and electric shocked when he lost control of a large wire and violated several other safe-work practices. *Settled.*

23. 12-06-96 Dennard vs. Altec
Deposition

Attorney Lester Tate -- *For Plaintiff*
P. O. Box 878
Cartersville, GA 30120

A lineman's hand was crushed when it was caught between the control lever of his bucket truck and the bottom of a transformer. The control levers were poorly designed. *Settled.*

24. 7-17-96 Raulerson vs. Okefenoke REMC
Deposition

Attorney Richard Rumrell -- *For Defendant*
One Hundred BLDG, Suite 250
Jacksonville, FL 32256
Circuit Court, Duval Co., FL

A laborer was killed when the electric meter pole he was setting contacted a 14,400-:volt power line. Telephone drop wires and cable television were a factor in making the power line lower. *Settled.*

25. 7-02-96 McCoy vs. Coach & Campers of Atlanta
Deposition

Attorney Nikolai Makarenko, Jr, -- *For Defendant*
100 Galleria Parkway, Suite 1510

Atlanta, GA 30309
State Court, Dekalb Co, GA

A customer separated his shoulder when the RV home shocked him. He was on the ladder on back, touched a grounded chain link fence and fell. The electric circuit to the RV was not grounded. *Settled.*

26. 6-07-96 Habeishi vs.Greystone Power Corp. Deposition & Trial

Attorneys Tisinger, Tisinger, Vance & Greer -- *For Defendant*
P.O. Box 2069
Carrollton, GA 30117
Federal Court, Northern District, GA

The electric power was off to a traffic signal because an electrical connection failed. It had been made improperly by Fulton County Traffic Dept. Two cars collided in the intersection killing both wives of the two drivers. *Jury Verdict $7,000,000.00!*

27. 5-16-96 Crossin vs. Central Illinois Light Co.
Deposition

Attorney Richard Glisson - *For Plaintiff*
837 South Fourth Street
Springfield, Illinois 62705
Circuit Court, Sahgamon Co., Illinois

A lineman was electrically shocked when he disconnected a ground wire at the top of a joint transmission and distribution pole. A transformer was connected to the pole ground. The ground was burned open before it connected to the distribution neutral. *Settled.*

28. 3-16-95 Lockhart vs. TCI Cable & BellSouth Deposition & Trial

Attorney M. Francis Stubbs - *For Plaintiff*
P. O. Box 9
Reidsville, GA 30453
Superior Court, Toombs Co., GA

A young man was killed when he struck a TCI guy wire with his neck while riding a motorcycle. The guy wire was abandoned but not maintained in a safe condition. The young man was violating the law by riding off the roadway. *Jury Verdict Defendant's Verdict.*

29. 9-21-94 Vandevender vs. Klein Tools, Inc. Deposition & Arbitration

Attorney Michael Smith - *For Defendant*
240Third ST
Macon, GA 31201
Federal Court, Middle District, GA

A truck operator was badly shocked and burned when he removed his rubber gloves and touched a bucket truck while a hot 7200-volt line was on the ground nearby. He sued Klein Tool Company claiming the grip used broke the wire allowing it to fall. *Arbitration-Defendant's ruling 2 to I.*

30. 8-24-94 Underwood vs. Georgia Power Company
Deposition

Attorney Rowland Dye — *For Defendant*
P.O. Box 2426
Augusta, GA 30903
State Court, Emanuel Co., GA

A laborer attempted to use a 20-foot re-bar to unclog a grain bin auger. He contacted a 7200-volt. power line with the metal bar and lost one arm and had serious burns. He claimed the line was too close. The line complied with the NESC. *Settled.*

31. 4-20-93 Buckner vs. Colquitt Electric Co-op
Deposition

Attorney John Austin — *For Defendant*
400 Perimeter Center Terrace, Suite 1050
Atlanta, GA 30346
Superior Court, Colquitt Co, GA

A laborer was shocked and fell from a pecan tree. He was using a 20-foot long aluminum pole to knock pecans from the limbs. *Settled.*

32. 8-05-90 Lockett vs. Georgia Power Company Deposition & Trial

Attorney Hugh McNatt — *For Defendant*
Vidalia, GA
Superior Court, Telfair Co., GA

Three laborers were raising an aluminum extension ladder under a 7200-volt power line. One was killed, one shocked, one was not hurt. The power line complied with the NESC. *Jury Verdict paid funeral expenses only.*

BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

In re: Proposed amendments to rules regarding overhead electric facilities to allow more stringent construction standards than required by National Electric Safety Code	Docket No. 060173-EU
and	
In re: Proposed rules governing placement of new electric distribution facilities underground, and conversion of existing overhead distribution facilities to underground facilities, to address effects of extreme weather events	Docket No. 060172-EU Filed: August 11, 2006

AFFIDAVIT OF DR. LAWRENCE M. SLAVIN

The undersigned, being duly sworn, states as follows:

1. I am currently Principal of Outside Plant Consulting Services, Inc. Previously, I had an extensive career at Lucent (formerly AT&T), Bell Telephone Laboratories and Telcordia Technologies (formerly Bellcore). My career at Bell Laboratories, at which I was selected to be a Distinguished Member of Technical Staff, spanned more than 28 years (1961-1989), primarily in telecommunications product design and development. During the subsequent 12 years (1990-2001), I was a member of Telcordia's research and professional service organizations, and served as Director of the Network Facilities, Components, and Energy Group, responsible for requirements, testing, and analysis of outside plant media, components, and powering for telecommunications applications, as well as related installation and construction guidelines.

2. I received my Ph.D in mechanical engineering from New York University in 1969, my Master of Science in engineering mechanics from New York University in 1963 and my Bachelor of Science in mechanical engineering from The Cooper Union for the Advancement of Science & Art in 1961.

3. I have been an active member of NESC Subcommittee 5 since 1998, including the development of the 2002 edition of the NESC and the recently issued 2007 edition. Subcommittee 5 (Overhead Lines – Strength & Loading) is directly responsible for specifying the storm loads and associated structural strength requirements referenced by the PSC. I am Chair of Working Group 5.7 (Seminars and Presentations; Subcommittee 5), and have served on Working Group 5.2 (Complete Revision of Sections 25 and 26; Subcommittee 5), and on the immediately relevant Working Group 5.8 (Application of Extreme Wind to All Structures; Subcommittee 5). I have also been Chair of Working Group 4.10 (New Ice Loads and Clearances; Subcommittee 4, Overhead Lines – Clearances), and serve on as the Accredited Standards Committee ASC-O5 (responsible for *ANSI O5.1, Wood Poles, Specifications and Dimensions*).

4. As Chair of WG 5.7, I have been responsible for organizing and coordinating the following industry information sessions, as well as providing some of the associated technical presentations:

- ***Panel Session: Structural Reliability-Based Design of Utility Poles and the National Electrical Safety Code*, 2003 IEEE Transmission & Distribution Conference and Exposition, 2003**
- ***Panel Session on National Electrical Safety Code (NESC), 2002 Edition, ANSI C2*, 2001 IEEE Transmission & Distribution Conference and Exposition, 2001**

- ***Panel Session on Proposed Changes to Strength & Loading Requirements for the 2002 Edition of the National Electrical Safety Code (NESC)*, IEEE Power Engineering Society, Towers, Poles & Conductors (TP&C) Subcommittee Meeting, 2000**

I will be chairing a panel session regarding the strength and loading requirements of the 2007 edition of the NESC, and presenting related technical information, at the TP&C Subcommittee Meeting in January 2007.

5. Appendix 1 attached to this Affidavit is a report I have prepared concerning proposed Rule 25-6.034 that is being considered in this proceeding. As I discuss in detail in the report, the proposed rule's requirement that electric utilities be guided by the extreme wind loading standards specified in the 2002 edition of the NESC could result in substantially higher facilities costs and lead to significant unintended consequences. Accordingly, I recommend that this requirement not be included in the proposed rule, or (if this recommendation is not accepted), that certain limitations be adopted.

6. Appendix 2 attached to this Affidavit provides more detailed information concerning my career in the telecommunications and related utility industries, including my activities in relevant professional organizations, such as the Main Committee and several Subcommittees for the NESC.

Further Affiant sayeth naught.

Lawrence M. Slavin

Subscribed and sworn to before me this 10 day of August, 2006.

Notary Public, State of NJ

My commission expires:
May 6, 2009

JENNIFER L. OSORIO
NOTARY PUBLIC OF NEW JERSEY
MY COMMISSION EXPIRES MAY 6, 2009

APPENDIX 1

Report Concerning Proposed Rule 25-6.034 As It Relates to Extreme Wind Loading Requirements

1. Introduction

This note provides comments regarding the proposed Florida Public Service Commission (PSC) Rule 25-6.034 to require that the extreme wind loading of the 2002 edition of the National Electrical Safety Code (NESC) be reflected in the design of electric utility-owned poles, including those with third-party (telecommunications) attachments. In particular, NESC-2002 Figure 250-2(d), part of NESC Rule 250C, is cited as a guide. The stated objective of the PSC is to "enhance reliability and reduce restoration costs and outage times" due to hurricane events, such as recently experienced during Hurricane Wilma. The present comments discuss the NESC rules (2002 edition), as applicable to the State of Florida, recent relevant discussions and decisions within the NESC Committee, and the impact of adopting the Extreme Wind Loads of Rule 250C throughout Florida.

2. NESC-2002

The NESC is an American National Standards Institute (ANSI) standard based upon a consensus of those substantially concerned with its scope and provisions, including the Institute of Electrical and Electronic Engineers (IEEE), which also acts as the Secretariat. Other members of the NESC Committee include organizations representing providers of electric power or communications service, their suppliers, and other affected or interested parties. The NESC includes various provisions for the safeguarding of persons from hazards from the installation, operation, and maintenance of electric supply and communication lines and equipment. The rules contain the basic provisions that are considered necessary for the safety of employees and the public.

In general, adherence to the NESC is voluntary; however, many commissions throughout the United States routinely adopt the latest edition, or specific editions, for application within their jurisdictions. For example, the Florida PSC has adopted the 2002 edition.

Sections 25 and 26 of the NESC provide the required strengths and loadings of utility poles and other structures. Section 25 specifies the type storm loads that Grade B or C utility lines are required to withstand. ("Grades of Construction" are discussed below.) Section 26 specifies the required strengths of the structures, as subject to the storm loadings specified in Section 25. (Most of Section 26 -- *e.g.*, Rule 261 -- applies to Grade B or C construction.) Two types of storms are specified -- (1) Combined Ice and Wind Loading (Rule 250B) and (2) Extreme Wind Loading (Rule 250C).

2.1 Combined Ice and Wind (Rule 250B)

Rule 250B refers to the Loading District map, NESC Figure 250-1, reproduced below. The three loading districts in the United States (Heavy, Medium and Light) specify the amount of radial ice buildup and a concurrent wind pressure. The Heavy and Medium districts in the north and central portions of the United States are subject to ½ and ¼ -

inch radial ice buildup, respectively, on all power and communications wires, cables, and conductors, and a concurrent wind pressure corresponding to 40 m.p.h.. The Light district in the southerly portion of the country, including Florida, is assumed to experience no ice buildup, but a wind pressure corresponding to 60 m.p.h. The latter wind speed, although only 50% greater than that assumed in the rest of the country, corresponds to a wind pressure of more than twice that in the Heavy or Medium districts, due to the strong (non-linear) dependence of the wind force on wind speed.[1] However, the lower pressure in the Heavy or Medium district is applied to a greater "sail area" due to the ice buildup on the wires and conductors. Depending upon the wire or conductor diameters, and the ice buildup levels, the resultant transverse loads in the "Light" district may exceed that in the so-called "Heavy" or "Medium" areas. In addition, the application of Rule 250B requires "overload" factors to be applied to the calculated wind forces to provide a conservative margin of safety when selecting appropriate pole sizes. A factor of 2-to-1 is applied to the common Grade C construction, and a factor of 4-to-1 is applied to Grade B construction, where required.[2] (See Section 2.3.) This procedure results in a fairly robust design that experience has shown to provide reliable, safe service.

PART 2. SAFETY RULES FOR OVERHEAD LINES

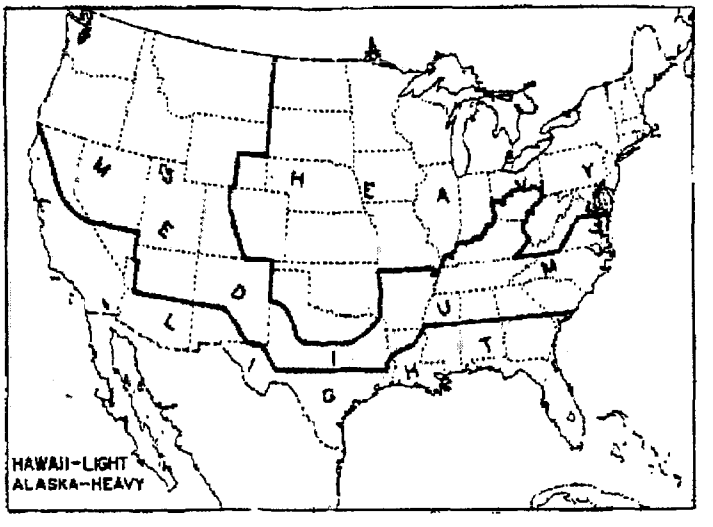

Fig 250-1
General Loading Map of United States
with Respect to Loading of Overhead Lines

[1] The wind pressure, or force, is proportional to the square of the wind speed.
[2] The present discussion assumes "tangent" pole lines, without significant corner angles where guys may be required. For such tangent lines, the transverse wind loads typically represent the critical design condition.

Rule 250B applies to all Grade B or C structures, regardless of height, and is typically used by most utilities to determine the strength requirements for distribution poles.

2.2 Extreme Wind (Rule 250C)

NESC Rule 250C refers to various wind maps, of which Figure 250-2(d), including the state of Florida, is reproduced below. The wind speeds[3] vary from approximately 95 m.p.h. (interpolated) in the north of the state to as much as 150 m.p.h. at the southern tip. The minimum 95 m.p.h. speed corresponds to a wind pressure of 2½ times that of the 60 m.p.h. wind assumed in the Light loading district. The maximum 150 m.p.h. speed corresponds to a wind pressure of more than six times that due to the 60 m.p.h. wind. However, the corresponding overload factors for Rule 250C are lower than that of Rule 250B, somewhat reducing the wide divergence in pole strength requirements. Nonetheless, if applicable, the impact on pole strength and sizes in Florida, and on utility construction practices and costs, would be major, as discussed in detail in Section 4. For various reasons, as discussed in Section 3.1, the NESC only applies Rule 250C to structures exceeding 60 feet in height above ground. This effectively exempts the vast majority of distribution poles. For cases where both Rule 250B and 250C apply, the larger effective loads would determine the required pole strength.

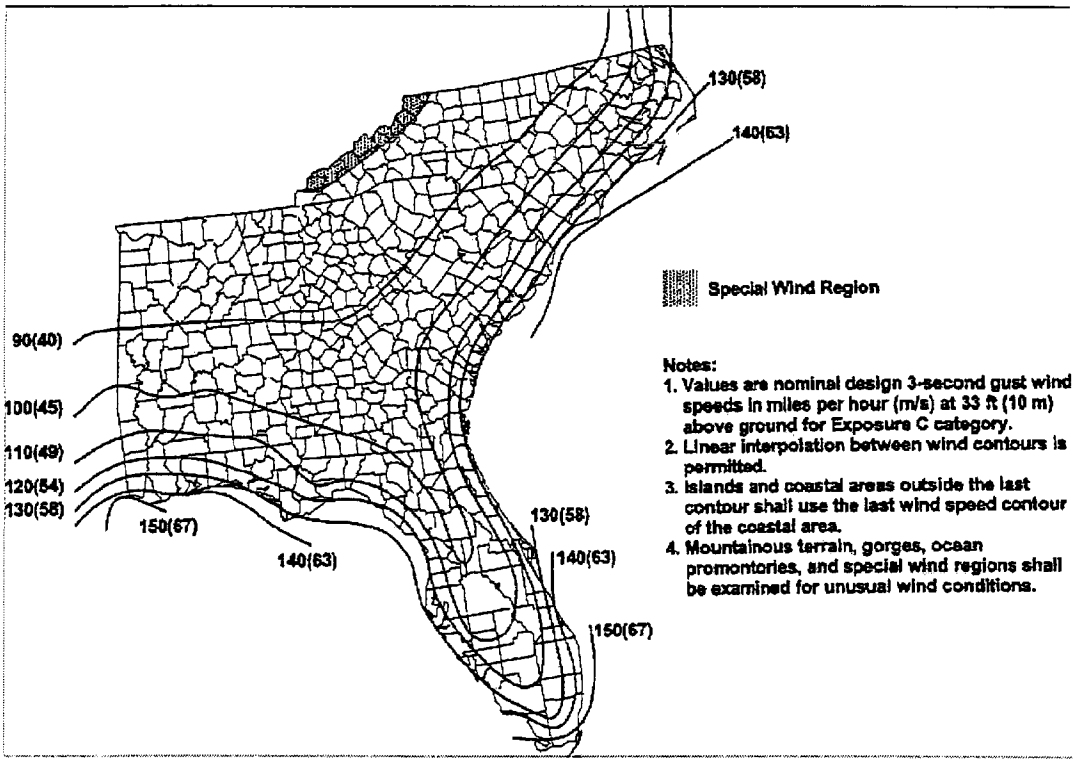

Fig 250-2(d)
Eastern Gulf of Mexico and Southeastern US Hurricane Coastline

[3] Figure 250-2(d) refers to "3-second gust wind speeds", which is approximately 20% greater than the 1-minute average wind speed used as the basis for categorizing hurricane levels by the Saffir-Simpson Hurricane Scale.

2.3 Grades of Construction

Section 24 of the NESC defines three Grades of Construction intended to distinguish between various situations, requiring varying levels of reliability, as implemented by the overload factors described above. In general, these grades depend upon the combination of voltage levels present in the power and communications conductors supported on the same poles, as well as various details, as specified. Most distribution poles carrying "primary power" (> 750 volts) at the upper portion of the pole, and communications cables below, are in the Grade C category. If the adjacent lines cross railroads tracks or limited access highways, a greater reliability level is required, corresponding to Grade B. Most power utility-owned poles are in the Grade C category.

The third grade of construction is Grade N, and applies if the voltages do not exceed 750 volts, corresponding to the lowest level of reliability.[4] This includes joint-usage poles supporting only "secondary power" (< 750 volts) or poles supporting only telecommunications cables.

The NESC does not provide specific storm loading or strength requirements for Grade N structures. NESC Section 25 (Loadings for Grades B and C) is not applicable to Grade N, and Section 26 (Rule 263) only states that "[t]he strength of Grade N construction need not be equal to or greater than Grade C" and that "[p]oles used for lines for which neither Grade B nor C is required shall be of initial size or guyed or braced to withstand expected loads, including line personnel working on them." This lack of specificity for Class N poles allows wide variability in application with respect to selecting appropriate pole strengths to withstand storms.

2.4 Required Strength & Pole Class

Based upon the wind pressures corresponding to the storm loads, as applicable, an appropriate strength pole may be selected. Wood pole sizes and strengths are specified in *ANSI O5.1, Wood Poles, Specifications and Dimensions*. ANSI-O5.1 provides a pole classification system based upon the ability of a pole to withstand lateral loads placed near the top of the pole, in a cantilever situation, such as may correspond to transverse wind loads on a pole with attachments. For example, a popular size Class 4 pole would typically (on the average) withstand a lateral load of 2,400 lbs applied 2 feet from the tip of the pole. A Class 3 pole is stronger, and would withstand 3,000 lbs. Within poles of Class 1 - 10, lower class number poles correspond to stronger (*i.e.*, larger diameter) poles. (Poles of strength greater than Class 1, are classified as H1, H2, and so on) with strength increasing with the H-number.)

Thus, a pole may be described as that supporting a specific "grade" of construction, corresponding to a level of required reliability (Grade B or C), or by a "class" size which is selected to match the strength needed to achieve the required reliability level. The strength is determined and calculated based upon the specified loading details (ice buildup and/or wind speed), the number and size (diameter) of the attachments to the pole, the span length between adjacent poles, and the grade of construction (via the overload factors discussed above).

[4] Grade B applies if the adjacent lines cross railroads tracks or limited access highways.

3. Upcoming and Future Editions of NESC

The 2007 edition of the NESC has recently been issued (August 2006) and is effective as of February 2007. Regarding storm loadings, several significant changes were introduced. Although Rule 250B was left unchanged, a new Rule 250D was added: "Extreme Ice with Concurrent Wind Loading." Similar to Rule 250C, Extreme Wind Loading, Rule 250D would only apply to structures exceeding 60 feet in height, exempting most distribution poles. In any case, this storm load would not have an impact in Florida due to the low associated ice (0-in.) and concurrent wind (30 m.p.h.) loads.

It is particularly interesting that Rule 250C has been modified for the common Grade C construction applications. In previous editions, the overload (design) factors for Grade B and C construction were the same, in spite of the greater implied reliability for the Grade B situations. This inequity was corrected in the 2007 edition by a *reduction* of as much as 25% in the effective design loads for Grade C construction. Thus, in contrast to possibly extending the Extreme Wind Loading to a larger category of structures and applications (*e.g.*, poles ≤ 60 feet height) the NESC requirements, where applicable, have been reduced. Nonetheless, there had been extensive effort and discussions regarding the possible extension of Rule 250C to structures of all heights, as described below.

3.1 Extreme Wind Loading -- Discussions

There is a seemingly eternal debate within the NESC Committee to consider eliminating the 60-foot exemption -- so that poles of all heights would then be subject to extreme wind loading. Such a revision was discussed within the NESC Committee with regard to the 2007 edition but, once again, was rejected. In fact, as described above, where applicable -- *i.e.*, poles taller than 60 feet -- the design requirement for Extreme Wind was actually reduced in severity for Grade C construction.

The rationale for rejecting consideration of extreme winds for "distribution" poles (*i.e.*, poles < 60 feet tall) is that the vast majority of industry experiences indicate that almost all damage to such lines is caused by wind-blown debris such as falling branches, and not by the wind forces acting directly on the wires and poles. In that case, little would be gained by attempting to design such poles to withstand the direct hurricane wind forces. The NESC Loading Section (NESC Section 25) does not explicitly use the term "distribution" when referring to these applications, but the 60-foot height threshold was chosen intentionally to exclude the vast majority of such poles. (In contrast, taller structures, such as critical transmission towers, would benefit from such a requirement.) In addition, to the best of my knowledge, the NESC Committee has never discussed extending any of the storm loads of Section 25 of the NESC (*i.e.*, Combined Ice and Wind or Extreme Wind) to Grade N applications, including telecommunications-only poles or joint-use poles with only secondary power (< 750 volts). Thus, the proposal of the PSC to extend Rule 250C to all distribution poles, regardless of height or grade of construction, would appear to be a major departure from present considerations in the NESC Committee, or industry in general. Thus, it would not appear to be "reasonably practical, feasible, and cost-effective" (to quote from proposed Rule 25-6.034(5)) to attempt to apply Rule 250C to Grade N joint-use distribution poles.

Related discussions within the NESC Committee to extend the Extreme Wind loading to structures of all heights (including distribution poles), focused on a particular change proposal, developed within Working Group 5.8, that would limit the impact of such an otherwise potentially dramatic change. In particular, for the Light Loading District portion of the country, which includes Florida, there would be no impact for distribution structures. However, based upon a multitude of industry comments objecting to even this diluted version of an Extreme Wind requirement for distribution poles throughout the country, this proposed change was not incorporated into the 2007 edition. It may be expected that this (rejected) change proposal will serve as a starting point for similar considerations for the 2012 edition of the NESC.

3.2 Future NESC Meetings (2012 Edition)

Although the 2007 edition of NESC is being issued essentially as this report is being written, efforts on the development of the subsequent 2012 edition are already being anticipated by Subcommittee 5. Due to the general interest in the effects of storm loads, such as hurricanes, and the effort required to properly consider the various aspects, Subcommittee 5 typically begins its meetings considerably earlier in the code cycle than most other subcommittees. Thus, initial meetings for development of the 2012 edition probably will begin in 2007. As a precursor, Working Group 5.7 of Subcommittee 5 (chaired by myself) will hold a panel session in January 2007 for the benefit of interested members of the power industry (IEEE Power Engineering Society, TP&C Subcommittee). The panel session will address the changes adopted in the 2007 edition, but will also discuss some of the proposals that were not accepted. The proposed (rejected) changes to Rule 250C, including the proposed extension to distribution structures, will be of particular interest, and will likely generate comments to be considered in the development of the 2012 edition.

4. Impact of Extending Rule 250C

The unlimited application of Rule 250C to all poles would have a major impact on the cost and operations of the utilities and the third party attachers, and would likely significantly affect the system reliability and restoration efforts, as well as public safety -- albeit not necessarily in the manner expected by the PSC.

4.1 System Cost

For electric utility-owned joint-use Grade N, Grade B or Grade C pole applications, the additional pole costs will depend upon the extent to which the proposed Extreme Wind load would exceed "reasonable" (albeit non-mandated) Grade N loads, and the already required Combined Ice and Wind load for Grade B or C applications for poles not exceeding 60 feet in height. Any increased strength requirement leads to stronger (larger diameter) poles, or a correspondingly greater number of poles (resulting in shorter span lengths), both of which would obviously be more expensive.

Figure 1 illustrates the relative pole strength in comparison to that currently required for the common Grade C joint-usage distribution application; *e.g.*, including primary power

(> 750 volts) with telecommunications cables mounted below the power cables.[5] Assuming the pole does not exceed 60 feet in height (65 feet in length[6]), such a pole must be designed to the present Combined Ice and Wind Loading (NESC Rule 250B, Figure 250-1, Tables 250-1, 253-1 and 261-1A). For present purposes, a tangent line (no corner angles) is assumed, for which the design is based upon the ability to withstand the transverse wind loading. For Florida, located in the NESC Light Loading District (Figure 250-1), this corresponds to a wind speed of approximately 60 m.p.h., but with an additional overload/design factor of approximately 2-to-1 for Grade C, and 4-to-1 for Grade B. For Grade N, a 1-to-1 design factor is conveniently ("reasonably") assumed. For the proposed application of Extreme Wind requirements (NESC Rule 250C), the wind-speed for Florida ranges from less than 100 m.p.h. (assumed to be 95 m.p.h.) in north-central area, to as much as 150 m.p.h. at the southern tip.[7]

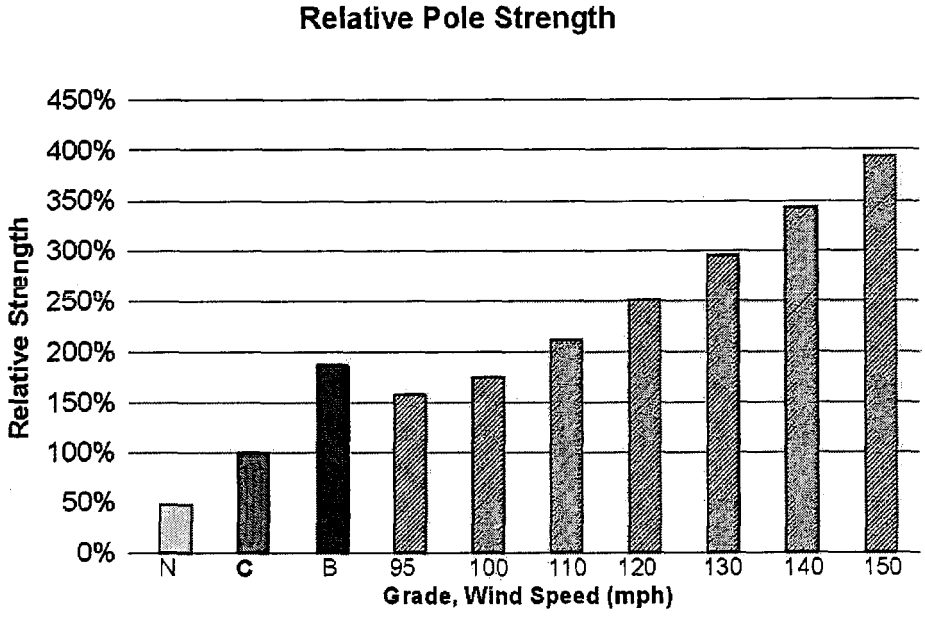

Figure 1
Relative Distribution Pole Strength vs. Typical Grade C Strength Requirements (NESC-2002)

The three solid bars to the left side of Figure 1, labeled "N", "C" and "B", depict the relative magnitude of the present required pole strength for a Grade N, Grade C, or

[5] Grade B construction would typically be limited to special situations (such as railroad crossings and limited access highways).
[6] Wood poles are available in 5 foot increments, and are buried at a depth of 10% the length plus 2 feet, with a slightly greater depth for poles shorter than 40 feet; *e.g.*, a 40-foot pole is buried at a depth of 6 feet, resulting in a 32 feet height above ground. (See ANSI-O5.1 wood pole standard.)
[7] A pole length of 40 feet is assumed. This parameter has only a minor effect on the results.

Grade B application. The seven cross-hatched bars to the right depict the relative magnitude of the required pole strength (which under the proposed rule would be the same for Grade N, C and B poles) due to Extreme Wind loads, at the wind speed indicated, should Rule 250C be directly extended to such applications. The results in Figure 1 thus show that the increased loading for an otherwise Grade C pole may be *increased* by a minimum of 50% (95 m.p.h.) or possibly as much as 300% (150 m.p.h.). In other words, the required strength, or number of poles, would be at least 1½ times -- and possibly as much as four times -- that currently required. For a Grade N pole application, the required strength would be at least three times -- and possibly as much as eight times -- a present reasonable design requirement. For the less common Grade B applications, the impact would not be realized for wind speeds less than 110 m.p.h. Nonetheless, significant strength increases would be required for wind speeds exceeding 110 m.p.h., which are characteristic of significant portions of Florida, as shown in Figure 250-2(d).

Figure 2 illustrates the corresponding pole class that would be required, assuming a Class 4 pole is necessary for the reference Grade C application, and the same number of poles (or span length) is maintained. Similar to Figure 1, the three solid bars to the left side of Figure 2 depict the representative pole class for a Grade N, Grade C, or Grade B application. The seven cross-hatched bars to the right depict the required class pole corresponding to the PSC proposed application of the Extreme Wind loads (which would be the same for Grade N, C and B poles). A minimum increase of three class sizes (to Class 1) for Grade C would be required for the minimum 95 m.p.h. wind, and as much as eight class sizes (to Class H5) for the 150 m.p.h. case. A Class 7 pole would otherwise suffice for the Grade N construction. As above, the Grade B applications would be affected to a lesser degree, but the increased size would still be significant for wind speeds above 110 m.p.h.

The increased pole material costs, including shipping and storage, are directly related to the number of poles or pole size (class). For larger, stronger poles, increased installation costs for the heavier poles may also be anticipated. Furthermore, the availability of such larger size (diameter) poles may be an issue.

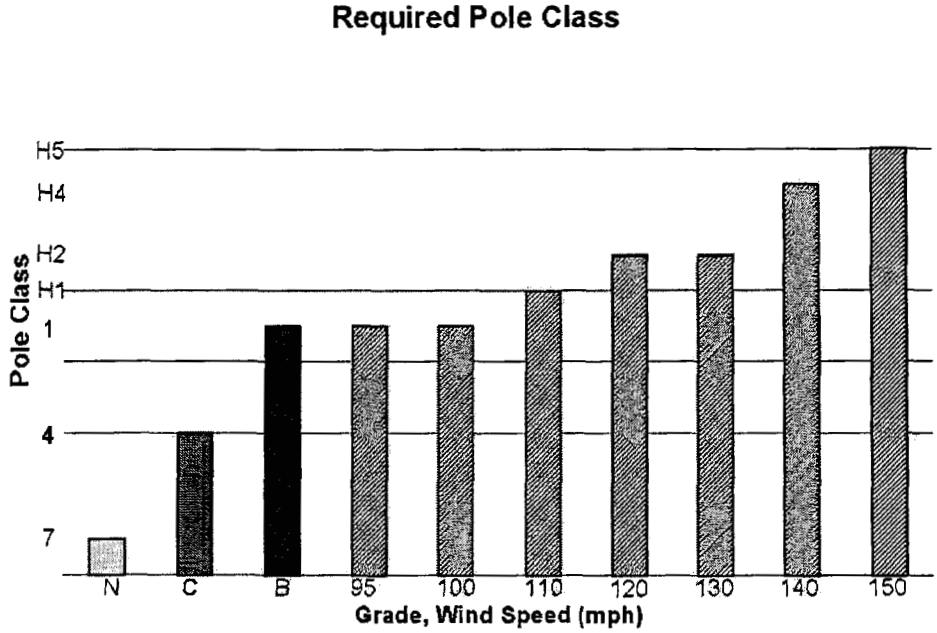

Figure 2
Required Distribution Pole Class vs. Typical Grade C Strength Requirements (NESC-2002)

4.2 Unintended Consequences

The imposition of the Extreme Wind requirement may result in unfortunate "unintended consequences," as sometimes occurs when changing long-standing practices that have generally been deemed successful. For example, as discussed above, the increased pole strength requirement would result in significantly stronger (stouter) poles or a larger number of more conventional size poles, corresponding to shorter spans. Such a practice would have a direct and negative impact on vehicular safety, and conflict with the objectives of the U.S. Department of Transportation, and presumably that of the DOTs of many states. The U.S. DOT is attempting to minimize the number of utility poles in order to reduce the incidence and severity of vehicular accidents. A greater number of poles, or stouter poles, would be contrary to such objectives. Thus, an attempt to modify a national safety code (*i.e.*, the NESC) to accomplish one objective may actually compromise public safety.

Other unintended consequences may also result from the introduction of the proposed Extreme Wind loading, due to a possible significant increase in the number of installed distribution poles along a given route. The June 8, 2006 Florida PSC Memorandum (page 5, Rollins) describes the likelihood that the supposedly less loaded individual poles would nonetheless be damaged in a hurricane, caused by the wind-blown debris and branches, resulting in the much more difficult, and time-consuming, recovery process to repair or reinstall many more poles.

Still another negative consequence relates to the engineering support associated with the implementation of the proposed Extreme Wind loads. The determination of the corresponding wind force is considerably more complicated than that of the existing transverse wind force based upon the present required Combined Ice and Wind loading. While such calculations are generally within the capability of experienced transmission engineers, with civil engineering training, they are beyond that of most distribution engineers. Indeed, one of the change proposals submitted for the 2007 edition was an attempt to simplify the engineering implementation of the Extreme Wind loads for even the applicable transmission applications. Although new or available software packages may alleviate the burden, there will be inevitable confusion and delays -- as well as possible errors in implementation -- in the design and installation of new facilities (including Verizon's fiber-optic networks), to the detriment of the consumers.

5. Recommendations

My primary recommendation is that the Commission not alter the manner in which the NESC's extreme wind loading standards are applied. The NESC is a well-respected document that is generally recognized as having served the industry and public well. For this reason, the NESC Committee (*e.g.*, Subcommittee 5, Strength & Loading) generally attempts to introduce significant changes in a gradual, evolutionary manner, in order to avoid or minimize the potential impact, including unintended negative consequences such as described above (Section 4.2). Thus, previous discussions within the NESC Committee (see Section 3.1 above) to extend the Extreme Wind loading to structures less than 60 feet tall (distribution poles), focused on a particular change proposal, developed within Subcommittee 5, that would limit the impact of such an otherwise potentially dramatic change. In particular, for the Light Loading District portion of the country, which includes Florida, the impact would have been insignificant. Nonetheless, based upon a multitude of industry comments objecting to even this diluted version of an Extreme Wind requirement for distribution poles throughout the country, this proposed change was not incorporated into the 2007 edition of the NESC.

Ideally, the Florida PSC should wait until the next code cycle of the NESC (2012 edition) before encouraging or requiring consideration of the NESC Extreme Wind loading. The related discussions within the NESC Committee during the development process would take into account the experiences during Hurricane Wilma, as well as other recent serious storms. Florida Power & Light, in particular, is well-represented on NESC Subcommittee 5. If the Florida PSC decides to change how the NESC's Extreme Wind loading standards are applied, it should be very cautious in the manner in which such a dramatic, controversial change is introduced. At the least, the Commission should attempt to limit the otherwise dramatic impact to as small a category of facilities as possible, or to reduce the magnitude of the impact. Thus, my alternative recommendation, in the event the Commission moves in this direction, is as follows:

- The proposed PSC rule should limit its scope to Grade B or Grade C applications of electric-only or joint-use poles owned by the electric utilities. Thus, Grade N applications -- which include joint-use poles with only secondary power (< 750

volts), as well as several categories of electric-only poles -- should be explicitly excluded from the proposed application of Rule 250C.

- The application of the NESC Extreme Wind load, as presently specified in NESC-2002, Rule 250C, should be modified to limit the quantitative impact to the affected distribution poles. For example, the reduced loads for Grade C construction incorporated into the latest (2007) edition of the NESC should be explicitly cited as consistent with the intent of PSC Rule 25-6034. For Grade C construction, the corresponding wind forces are reduced by as much as 25% compared to NESC-2002. NESC-2007 is being issued in August 2006, and is effective within six months (February 2007).
- The proposed PSC rule, preferably as modified above, should be applied on a trial basis, initially limited to a specified geographic area and a defined period (*e.g.*, 1-2 years), in order to better understand the potential benefits and consequences of such a rule.

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APPENDIX 2
About Outside Plant Consulting Services, Inc. (OPCS)
(Dr. Lawrence M. Slavin)

Outside Plant Consulting Services, Inc. (OPCS) was established in the year 2002 to help meet the needs of the telecommunications and power industries in establishing standards, guidelines and practices for outside plant facilities and products. The OPCS Group provides related support services for field deployment, and product evaluation and analysis. Dr. Lawrence (Larry) M. Slavin, Principal of OPCS, has extensive experience and expertise in such activities, based upon his many years of service at AT&T/Lucent Bell Telephone Laboratories (Distinguished Member of Technical Staff) in telecommunications product design and development, followed by a career at Telcordia Technologies (Bellcore) in its research and professional service organizations.

As Principal Consultant and Manager/Director of the Network Facilities, Components, and Energy Group at Telcordia, Dr. Slavin was responsible for professional services related to the telecommunications industry. These activities included technical leadership in developing installation and construction practices and "generic requirements" documents, introducing new construction methods, and performing analyses on a wide variety of technologies and products (such as poles, duct, wire and cable, electronic equipment cabinets, flywheel energy storage systems and turbine-generators). Throughout his long career, he has had a leading role in the evolution of many telecommunications related fields and disciplines – including aerial and buried plant design and reliability; advanced construction and cable and duct placement techniques; copper pair, coaxial, and fiber-optic technology; flywheel energy storage systems; physical design and development of hardware and electronic and electro-optic systems (such as the "SLC 96" digital loop carrier); cable media and equipment reliability studies; exploratory fiber-optic hardware development; and systems engineering.

Dr. Slavin is a member of several subcommittees of the National Electrical Safety Code Committee, responsible for specifying safety standards for aerial and buried telecommunications and power facilities in the United States. He is also an active member and participant on the Accredited Standards Committee ASC-O5 ("ANSI-O5") for wood poles and products, as well as on several related committees of the American Society of Civil Engineers. In addition, Dr. Slavin is a Charter Member of the North American Society for Trenchless Technology, has been instrumental in the development of directional drilling standards, and directly supports training activities for the directional drilling industry at the Center for Underground Infrastructure and Research and Education (CUIRE) at Michigan State University. Specific present and recent industry activities are listed below.

Industry Activities

- **National Electrical Safety Code Committee**
  - Represents the national telephone industry, via Alliance for Telecommunications Industry Solutions, ATIS
  - Executive Subcommittee
  - Main Committee
  - Subcommittee 4 (Overhead Lines – Clearances)
  - **Subcommittee 5 (Overhead Lines – Strength & Loading)**
  - Subcommittee 7 (Buried Lines)
- **Accredited Standards Committee ASC-O5**
  - ***ANSI O5.1, Wood Poles, Specifications and Dimensions***
  - *ANSI O5.2, Wood Products, Structural Glued Laminated Timber for Utility Structures*
  - *ANSI O5.3, Wood Products, Solid Sawn-Wood Products and Braces*
- **Pole Reliability Based Design (RBD) Committee, ASCE**
  - ***Reliability-Based Design of Utility Pole Structures***
- **Distribution Pole Standard Committee, ASCE**
- Committee F17 on Plastic Piping Systems, ASTM
  - Subcommittee F17.67 on Trenchless Plastic Pipeline Technology
  - Task Group Leader for development of HDD Standard ASTM F1962
  - *ASTM F1962, Standard Guide for Use of Maxi-Horizontal Directional Drilling for Placement of Polyethylene Pipe or Conduit Under Obstacles, Including River Crossings*
- Trenchless Installation of Pipelines (TIPS) Committee, ASCE
  - *ASCE Manual of Practice for Pipe Bursting Projects*
- Center for Underground Infrastructure and Research and Education (CUIRE) at Michigan State University
  - Industry Advisory Board
- Trenchless Technology Center, Louisiana Tech University
  - Industry Advisory Board
- North American Society for Trenchless Technology (NASTT)
  - Charter Member
  - Chair of Directional Drilling Subcommittee
- Missouri Western State College
  - HDD Steering Committee

PROCESS TO ENGAGE
THIRD PARTY ATTACHERS

1. The electric utility and third-party attachers will engage in a continuous dialogue on the status of the electric utility's storm hardening plans. A third-party attacher that wishes to be part of this process ("Participant") shall provide notification in writing to the electric utility, providing the name and address of the person designated to receive communications from the electric utility. The electric utility may, no more than once a year, request that Participants confirm that they wish to continue being part of the process and update the name and address of the person designated to receive communication.

2. By September 5 of each year, the electric utility shall provide the Participants with a list of the projects identified in the electric utility's approved storm hardening plan on file with the Commission ("Plan") that the electric utility proposes to undertake in the following calendar year, pending internal budget approval. The electric utility shall provide the Participants with a list of such projects receiving final budget approval promptly as it becomes available.

3. Prior to engineering a job relative to a storm hardening project identified in its Plan, the electric utility shall initiate a meeting with Participants to discuss the electric utility's preliminary ideas for the scope of work ("Pre-Design Meeting"). At the Pre-Design Meeting, the electric utility shall (a)

identify the poles involved; (b) identify whether the electric utility plans to replace poles, change from wood poles to poles of another material (*e.g.*, steel or concrete), place poles in locations different from the existing poles, relocate overhead facilities or underground existing aerial facilities, and; (c) provide the projected commencement date; (d) upon request by a Participant, provide other available information that would enable the Participants to make necessary preparations and evaluate whether to seek dispute resolution pursuant to Rule 25-6.0342(7). During this pre-design phase of a project, the electric utility shall also seek input from Participants as required by Rule 25-6.0342(6).

4. The electric utility shall provide Participants with final engineering plans promptly upon completion. Prior to beginning construction, the electric utility shall initiate a meeting with Participants to discuss coordination of work and a construction schedule.

5. Information submitted to Participants pursuant to section 2, 3 or 4 above regarding projects identified in the electric utility's Plan will not be docketed unless a protest is filed in accordance with Rule 25-6.0342(7), or it is otherwise deemed necessary by the Commission.

6. If the electric utility seeks to amend its Plan by, for example, adding a project not previously identified in its Plan, it shall file a petition with the Commission requesting that the Plan be modified in accordance with Rule 25-6.0342(2).

7. The electric utility will file with the Commission by March 1 each year a status report of its implementation of its Plan. Included in this status report shall be the name of storm hardening projects commenced and/or completed by the electric utility, the routes and circuits affected, and any comments on the project received from third-party attachers.