ERRATA SHEET

IN RE: DOCKET NO. 080244-EI
DOCKET NO. 070231-EI
PROCEEDING: Hearing
DATE: June 3, 2009

PAGE	CORRECTION
Page 37-71	Replace the Direct Testimony of Peter J. Rant, P.E., with the Revised Direct Testimony of Peter J. Rant, P.E.

6/17/09
DATE

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BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

DOCKET NO. 070231-EI, FPL'S PETITION FOR APPROVAL OF REVISIONS TO URD TARIFFS

AND

DOCKET NO. 080244-EI, FPL'S PETITION FOR APPROVAL OF REVISIONS TO UNDERGROUND CONVERSION TARIFFS

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

Q: Please state your name and business address.

A: My name is Peter J. Rant. My business address is 1616 East Millbrook Road, Suite 210, Raleigh, North Carolina 27609.

BACKGROUND AND QUALIFICATIONS

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

A: I am employed by PowerServices, Inc. as Vice President and by UtilityEngineering, Inc. as Vice President. My chief responsibilities include professional engineering oversight of electric power delivery projects including overhead and underground transmission and distribution. This includes preparing system planning studies to account for growth and reliability, cost estimating and feasibility, and overall operability. I also develop designs for an array of projects and together with our staff manage these projects through construction and commissioning. In my capacity as a Vice President, I provide a range of consulting services to various clients, including municipal, cooperative, and investor-owned utilities, municipalities, federal and state government entities, and private-sector companies with regard to many electric issues. For example, I advise clients on system design and construction practices and costs associated with various configurations of equipment.

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

A: I graduated from Clarkson University in Potsdam, New York with a Bachelor of Science degree in Electrical Engineering in 1990. While obtaining this degree, I specialized in courses within the electric power field including power systems analysis, electric power system control, transmission and distribution, and protective relaying for electric utility systems. As a professional engineer, I am active in continuing professional education to maintain a current base of knowledge with the technology of materials, installation, and operations as well as a range of engineering topics many of which are directly applicable to this docket. A copy of my resume' is attached to my testimony as Exhibit PJR-1.

Q: Please summarize your employment history and work experience.

A: From 1990 to 1994 I served as a Lieutenant in the United States Army Signal Corps with responsibility for remote site power systems in various locations within the United States and Central America. In 1994 I joined Booth & Associates, Inc. in Raleigh, North Carolina and began consulting engineering for electric utilities and other owners of medium voltage electric systems, predominantly dealing with the design and construction of overhead and underground electric distribution systems. I held positions of increasing responsibility at that firm: Junior Engineer, Project Manager, Manager of Distribution Design, and Operations Manager for the Transmission and Distribution Division. In 2005, I joined UtilityEngineering, Inc., my current employer, as Vice President. In 2007, PowerServices, Inc. and UtilityEngineering, Inc. consolidated operations, and I assumed similar responsibilities under each company. I am responsible for all aspects of design of transmission and distribution lines in addition to other consulting tasks.

I have specific experience with storm hardening initiatives in coastal North Carolina. From 2000 until 2004, I was the project manager and engineer of record for an 88-mile overhead-to-underground electric distribution conversion project on four barrier islands in southeastern North Carolina. Brunswick Electric Membership Corporation (BEMC), a cooperative utility, undertook this large-scale undergrounding effort following the severe hurricane impacts of the mid-1990's, particularly those from Hurricanes Bertha and Fran. BEMC undertook the project to improve reliability and storm restoration time for its entire system by placing all barrier island lines on it's system underground. The four islands, Oak Island, Holden Beach, Ocean Isle, and Sunset Beach were and are all served by BEMC.

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

More recently, since 2005, I have completed several storm hardening projects in Mississippi following the devastation of Hurricane Katrina. These have included underground distribution and exterior lighting for the VA Medical Center in Biloxi, overhead to underground conversion and lighting for the Air National Guard Combat Readiness Training Center in Gulfport, and overhead to underground conversion and lighting upgrades at the Naval Construction Battalion Center in Gulfport. Each of these projects required the employment of high reliability components intended to maximize reliability while minimizing operations and maintenance costs.

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

A: Yes. I testified on behalf of the City of Panama City Beach, Florida in Florida PSC Docket No. 070299-EI, regarding Gulf Power Company's Storm Hardening Plan. I also made a presentation, not formal sworn testimony, before the Florida Public Service Commission in April 2007 regarding Florida Power & Light Company's contributions in aid of construction for underground conversion projects. My comments addressed the appropriate treatment of the cost savings from undergrounding in determining the appropriate level of such contributions. I have also prepared to testify in a number of cases that settled before trial or hearing.

Q: Do you hold any professional registrations?

A: Yes. I am a Registered Professional Engineer in the States of Florida, North Carolina, Virginia, Maryland, Tennessee, Ohio, Arizona, Mississippi, Pennsylvania, and in the District of Columbia. I also maintain a Council Record with the National Council of Examiners for Engineering and Surveying.

SUMMARY AND PURPOSE OF TESTIMONY

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

A: I am testifying on behalf of the Municipal Underground Utilities Consortium (MUUC), the Town of Palm Beach, Florida, the City of Coconut Creek, Florida, and the Town of Jupiter Inlet Colony, Florida to explain and support of their positions regarding the proper Contributions in Aid of Construction (CIACs) that FPL should charge for conversions of overhead electric distribution facilities to underground facilities and regarding the proper Underground Residential Distribution (URD) charges, a form of CIACs, for new underground distribution installations.

Q: Please summarize your testimony.

A: The MUUC on whose behalf I am testifying seeks to ensure that CIACs paid to FPL for conversion and new underground electric distribution are determined in a manner which is fair to both the applicant and to the general body of ratepayers. Accordingly, a substantial effort has been undertaken to understand both the costs and benefits of undergrounding since the severe storm season of 2005. The MUUC, FPL, and the PSC staff now generally agree on the overall method to account for costs and benefits in terms of determining appropriate CIACs by establishing adjustments to the straight underground minus overhead costs for items such as avoided storm restoration costs (ASRC) and operational costs differences. However, it is my professional opinion that certain components of the calculation in FPL's tariff do not represent the true value provided and thus result in a higher than appropriate CIAC.

Underground (UG) electric distribution facilities provide significant benefits to utilities and their customers in several ways:

- providing more reliable service with far fewer outages and customer outage-hours;
- reducing the restoration costs associated with damage from hurricanes and tropical storms;
- reducing the restoration costs associated with damage from weather events other than named hurricanes and tropical storms; and
- providing other operation and maintenance (O&M) cost savings vs. comparable overhead (OH) distribution facilities, including reductions in vegetation management costs, pole inspection and remediation costs,

costs incurred due to litigation, settlements, and damages awards from electrical contact accidents, and overall system maintenance.

- preserving utility base rate revenues through reduced total customer outages due to major storms and other weather events, vegetation-caused outages, and outages due to vehicles hitting OH facilities.

These cost savings should be reflected in the CIAC and CIAC-type charges that utilities, including FPL, charge for underground conversion projects and for new UG installations. Failure to include these savings will result in customers served by UG facilities subsidizing the utility and its other customers.

With other members of PowerServices' and UtilityEngineering's staff, I prepared an extensive analysis of the differences between the O&M costs for UG facilities vs. OH facilities, Cost-Effectiveness of Undergrounding Electric Distribution Facilities in Florida, which we prepared for the MUUC in 2006. We concluded that FPL's estimates of the savings in storm restoration costs, albeit calculated very differently from our estimates, were reasonable. Our estimates of the differences in O&M costs for UG vs. OH facilities indicated that UG systems would be expected to save substantial amounts of O&M expenditures vs. equivalent OH facilities. Our analyses showed that UG facilities would be expected to save approximately $224,000 per pole-line mile in non-storm-related O&M costs vs. equivalent OH costs.

Our analysis was based on available data (generally 2001 to 2005) at the time. FPL has since provided a significant level of additional detail, and our analysis now shows that this differential should be $122,189.00 per pole-line mile (PLM) in non-storm-related O&M costs which is an additional 14.63 percent reduction of the otherwise applicable CIAC. FPL has understated costs for OH vegetation management and overstated the costs for UG operations and maintenance as well as the replacement costs for UG facilities. FPL's proposed charges for UG installations, as set forth in its proposed revisions to its tariffs for new underground installations (in Docket No. 070231-EI) and for underground conversions (in Docket No. 080244-EI) fall short of recognizing and giving full credit for these non-storm-related savings.

FPL's analyses by which it has attempted to justify its understated cost savings from underground facilities are systematically flawed and biased against UG facilities in several ways:

- FPL's analyses are systematically biased against UG because they are based on O&M costs for an average of all existing UG facilities on FPL's system, whereas well over half of those facilities were installed before 1990, and more than one-fourth of those facilities were installed before 1980, and new UG facilities not only utilize much better technology than 20- and 30-year old UG facilities but will also have much lower life cycle O&M costs due to the significant experience FPL has gained at employing this equipment throughout its service territory.

- FPL's analyses are systematically biased against UG because they are based on capital replacement costs for an average of all existing UG facilities on FPL's system, whereas well over half of those facilities were installed before 1990, and more than one-fourth of those facilities were installed before 1980.
- FPL's historical O&M costs for UG reflect significantly higher levels due to expenditures for equipment failure and remediation measures which are no longer representative for newly installed UG distribution facilities.

Our analyses show that the CIAC charges for UG installations should be significantly less than those proposed by FPL. Instead of an additional charge of $11,400 per PLM for UG conversions non-storm O&M differential, there should be a credit of $122,189.00 per PLM in addition to the other operational benefits that will further reduce the CIAC charge for UG conversions.

This revised cost adjustment is based on analysis presented in this testimony which reflects consideration of PowerServices' and UtilityEngineering's direct field experience with UG facilities and currently available industry information, as well as review of FPL's original and amended tariff filings, the testimony of Mr. Thomas R. Koch dated March 1, 2009 and of FPL's response to discovery requests by the MUUC and the PSC staff.

It is indeed appropriate to recognize that larger UG projects, whether new construction projects or UG conversion projects, provide greater storm restoration benefits than smaller projects. However, FPL's "tiered" approach to recognizing those differences is also seriously flawed and would result in unfair charges being applied to projects close to the "breakpoints" that FPL has proposed for the "middle tier" of its three designated "tiers" of project sizes. In my testimony, I am proposing a formula approach which would yield a fair result for all projects within the "middle tier".

Q: Are you sponsoring any exhibits in these proceedings?

A: Yes. I am sponsoring the following exhibits:

Exhibit PJR-1	Resume' of Peter J. Rant, P.E.
Exhibit PJR-2	2006 PowerServices report entitled Cost Effectiveness of Undergrounding Electric Distribution Facilities in Florida
Exhibit PJR-3	Updated PowerServices analyses
Exhibit PJR-4	White Paper – Utility Puts TR-XLE and EPR Cables to the Test by Shattuck and Hartlein
Exhibit PJR-5	Presentation – Technical Trends in Medium Voltage URD Cable Materials and Design by Dudas

Exhibit PJR-6	Presentation entitled Community of Captiva Island, Florida PowerServices, Inc. Report Supporting Information by R. L. Willoughby
Exhibit PJR-7	FPL's 2006 Storm Restoration Cost worksheet (that derived the original 25% GAF)
Exhibit PJR-8	FPL's URD worksheet package
Exhibit PJR-9	FPL's UG conversion worksheet package
Exhibit PJR-10	FPL's responses to MUUC's Sept 2008 Data Requests
Exhibit PJR-11	FPL's responses to MUUC's March 2009 Interrogatories
Exhibit PJR-12	Formula for solving the "tiers" issue

BENEFITS AND COSTS OF UNDERGROUNDING

Q: What are the benefits and costs of undergrounding as compared to overhead distribution facilities?

A: In general terms, UG facilities cost more to install than OH facilities, so this initial cost differential is a net cost of having underground facilities. Additionally, where a UG project is a conversion project as distinguished from a new, "greenfield" installation, there are additional costs, including removal costs and additional preparation costs, associated with the UG project. On the other side of the ledger, however, UG facilities provide significant savings to utilities and their customers in the form of reduced storm restoration costs, reduced O&M costs, and preserved utility revenues, which are realized because UG facilities reduce total customer outages.

Q: Do you agree with FPL's calculation of avoided storm restoration costs (ASRC)?

A: In general, I believe that the results of FPL's calculations are fairly accurate. Significant analysis by FPL, the MUUC, and others has recognized within a fairly narrow margin, the benefits associated with avoided storm restoration costs. I do believe that many studies overstate the effects of storm surge and flooding on UG lines and equipment mainly because they typically affect relatively few facilities compared to the total number installed. In most cases following major storms, power cannot be immediately restored to areas affected by heavy surge and flooding due to the extensive damage to buildings and other infrastructure, regardless of whether those areas are served by UG or OH. PowerServices' analysis (Exhibits PJR-1 and PJR-2) that the major storm restoration costs are in the 24 percent range which compares to FPL's 25 percent credit and non-major weather event restoration costs are in the 5 to 6 percent range. The CIAC should be adjusted by this additional percentage for non major storm restoration savings.

Q: Please explain how underground distribution facilities reduce non-storm-related O&M costs as compared to OH facilities.

A: Underground facilities reduce O&M costs in several ways beyond savings in restoration costs following major storms. First, UG facilities are (again with very rare exceptions) not subject to weather-related restoration costs from severe thunderstorms, microbursts, tornadoes and other weather events that impact OH facilities on a frequent basis. Second, in practical terms, the utility avoids all vegetation management – "tree-trimming" – costs by using UG facilities instead of OH facilities. Third, UG facilities have lower costs than OH facilities for O&M cost categories other than storm restoration and vegetation management costs based upon currently employed technology. Fourth, the incidence of people contacting energized or "hot" underground conductors is extremely infrequent, whereas there are far too many instances of persons contacting OH lines and facilities, which result in litigation costs, settlement payments, and in some cases damages awards not to mention directly paid medical and other costs. Having distribution facilities underground avoids these costs as well.

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

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

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

A: Yes. Brunswick Electric Membership Corporation's UG-served barrier islands were impacted by a direct hit by Tropical Storm Ernesto in 2006. Not only did the UG-served barrier islands come through Ernesto without any loss of service, but BEMC's management advised me that the Cooperative was able to deploy restoration crews to its OH-served areas on the mainland, thereby achieving more rapid restoration of those OH areas. In fact, BEMC's operations and engineering managers have indicated that this is a frequent occurrence even during summer thunderstorms and similar events. The result is improved system reliability on a year round basis. Additionally, these are among the benefits identified by Florida Power & Light Company as supporting and justifying the reduction in its Contribution in Aid of Construction (CIAC) for large-scale, government-sponsored UG conversion projects as currently approved in FPL's tariff.

Q: Please explain any other benefits from having distribution facilities underground.

A: In terms of direct economic benefits to utilities and their customers, undergrounding provides meaningful benefits because it preserves base rate revenues through reduced customer outage hours and accordingly greater sales. Under any scenario, this will at least benefit the utility in the short run and the utility or its customers, or both, in the long run.

Q: Are there any offsetting factors by which having UG facilities might actually increase a utility's costs as compared to OH facilities?

A: Yes. The utility will lose pole attachment rental revenues and will incur additional costs for locating UG facilities ("UG locates").

Q: Is it your position that all undergrounding projects should be undertaken regardless of costs?

A: No, definitely not. When discussing this issue, opponents of undergrounding as a reliability or storm hardening technique always refer to the costs and various studies which point out the rate impact of converting all lines to underground. Targeted and limited undergrounding has direct positive impact on system reliability and restoration. The initial cost of installation of UG is higher than OH in most cases which is why charging an appropriate level of CIAC is a sound and prudent way to ensure that all rate payers both pay and receive their fair share.

TECHNOLOGY IMPROVEMENTS WITH UNDERGROUND SERVICE

Q: Have there been advancements in the technology of underground distribution which would impact costs and corresponding rates charged for underground service?

A: Yes. Underground distribution technology, reliability, and corresponding life cycle costs have improved tremendously since utilities began installing larger quantities of so-called URD systems.

Q: Can you describe some of these advances and their impacts?

A: Certainly. In my exhibits PJR-4, PJR-5, and PJR-6, I have compiled some brief summary examples of these advances. FPL has adjusted materials and practices for construction in keeping with the utility industry's advances. For example, as clearly stated in its filing and supporting materials, FPL installs cable in conduit for both physical protection, and to speed restoration of service in the event of a cable failure. FPL has transitioned cable technologies to TR-XLPE cable to improve service life of cable from less than twenty years in some cases to more than forty years in most cases. (See page 3 of Exhibit PJR-4.) Two presentations which I have included as Exhibits PJR-5 and PJR-6 provide a very brief but good summary of the history of these advances and corresponding improvements in life expectancy of UG. FPL has embraced best practices including looped UG design, better cable (TR-XLPE), dead-front design equipment which is less susceptible to flashover failures at the cable terminations, newer surge arrester and elbow termination technology, and better overall manufacturing quality control. All of these factors will lower both outage rates and restoration times as more mileage is added to the FPL system. This will bring the life cycle costs of new UG down significantly.

Q: Have similar advances been made to OH materials and equipment?

A: There have been some advances to overhead materials and how they are applied. However, the basic technology for OH distribution lines has remained relatively unchanged. In fact, wood pole longevity has varied depending on the rate of growth of the trees used for poles, type and quality control of preservative treatment and other environmental factors. While some materials such as polymer insulators and MOV polymer surge arresters have advanced, the overall life expectancy of OH lines and their corresponding life cycle costs have not improved to the degree that UG systems have.

Q: Are OH costs going up, down, or remaining constant?

A: OH costs are affected by some of the same underlying cost impacts that UG lines are, so commodities prices will cause prices to rise and fall within certain time windows. However, storm hardening initiatives will increase required capital expenditures for OH lines both in initial cost and for renewals and replacements over time.

Q: What impact will these factors have on FPL's relative costs for OH and UG construction?

A: The average life cycle costs for UG over time will trend downward as older technology facilities are replaced, and as new UG facilities using current state-of-the-art technology are added to FPL's system, and the life cycle costs for OH will go up since many of the hardened facilities will cost more to maintain. For example, stronger wood poles will still be subject to rot and decay and replacement costs will be higher. Certain facilities such as concrete poles may in fact last longer, but hardware will still require replacement and the cost of stronger poles and components will be an offsetting factor to increased longevity. While we cannot predict the full effect of OH hardening efforts without more time and experience, from my experience, I expect cost reductions for UG due to technology advancements to be greater in the long run than any longevity savings that might accrue from hardened OH.

UTILITY CHARGES FOR UNDERGROUND SERVICE

Q: The subject matter of these proceedings is what FPL's charges for UG conversions and for new UG installations should be. How do the factors and issues that you discussed affect what FPL's charges for underground facilities should be?

A: A utility's charges for UG facilities, including both the utility's CIAC charges for converting OH facilities to UG facilities and the utility's CIAC or CIAC-type charges to install new UG facilities instead of OH facilities, should reflect the differences in life-cycle costs between the two systems. The relevant differences are both the difference in initial cost, where UG facilities cost more than OH facilities, and the difference in expected or projected O&M costs, plus differences in certain other factors that influence the utility's bottom-line costs of having either OH or UG facilities.

Q: Can you state this as a formula?

A: Yes. Basically, the conceptual formula is the same as that set forth in FPL's tariff for UG conversions, on Tariff Sheet No. 6.300:

CIAC = Cost of the UG Facilities

Plus: O&M Costs for the UG facilities

Minus: Cost of equivalent OH facilities

Minus: O&M Costs for the OH facilities

Plus or Minus: Other factors.

Q: What types of costs are included in what you call O&M costs?

A: O&M costs, or "operational costs" include:

- Outage restoration costs from major storms, other weather events, vegetation contact, and other events (such as restoration that must be done after a motor vehicle hits an OH pole).
- Vegetation management costs.
- Pole inspection costs.
- Other day-to-day O&M costs.
- Costs for accident litigation, settlement, and awards.

Q: What other factors are relevant to O&M costs?

A: Several factors, even though they are not actual O&M costs, nonetheless have a real impact on the costs to the utility and its customers. For example, if UG facilities are replacing existing OH facilities that are new or nearly new, the undepreciated cost of the OH facilities being removed and the removal costs are properly charged against the cost of the conversion, and the salvage value of the removed OH facilities is properly credited to the conversion. On the other hand, if the facilities being removed are essentially at the end of their useful life or should be replaced anyway, then there should be no charge to the conversion project for any remaining book value of the facilities nor for the removal costs; similarly, there would be no salvage value of such facilities to be credited to the conversion project.

Q: Are there other factors?

A: Yes. Preserved revenues provide a real benefit to the utility and to the utility's customers and should be reflected as a credit to (or, hypothetically, as a debit against) a UG installation. I say that any debit would be hypothetical because it is possible, though highly improbable and outside my experience, that in an extreme case, total customer revenues could be less due a prolonged outage of a UG system. In the extreme case of UG facilities serving a barrier island community being washed out, it would take longer to replace UG facilities than OH facilities; however, in such a wash-out case, it is most likely that the structures served by the distribution facilities would not be restored to habitable or usable condition before the UG distribution facilities could be replaced. Additionally, lost pole attachment revenues and the cost of providing "UG locates" would be essentially debited against any underground lines.

Q: In an earlier response, you stated that a utility's charges to install UG facilities, including both replacement of existing OH facilities or new UG

instead of new OH facilities, should reflect the differences in life-cycle costs between the two systems. Why is this important?

A: This is important because, if the charges don't reflect the life-cycle cost differences, customers served by UG facilities will subsidize those served by OH facilities. A simple example from FPL's experience illustrates this quite clearly. Following its experiences in the 2004 and 2005 storm seasons, FPL proposed its Governmental Adjustment Factor waiver, which provides a credit of 25% off the otherwise applicable CIAC for government-sponsored UG conversions. As justification for the proposal, FPL provided a worksheet, reproduced as Exhibit PJR-8 to my testimony, in which FPL estimated that the restoration costs for OH facilities for the seven named storms that impacted FPL in 2004-2005 were 90 percent of its total distribution restoration costs for those storms. However, well over half of FPL's customers are served by UG facilities, which accounted for at most 10 percent of the restoration costs per FPL's estimates. See my Exhibit PJR-2, which shows that as of December 31, 2007, approximately 3,093,000 customers out of a total of 4,859,000 customers were served from underground facilities. Even taking account of the fact that many of the UG-served customers are served by UG facilities that emanate from OH primary feeders, it is highly likely that the majority of the restoration costs were associated with overhead lateral feeders, overhead service laterals, poles, and other OH facilities. When it comes to paying for these costs, however, all of FPL's customers, whether served by OH or UG facilities, pay exactly the same Storm Restoration Surcharge, presently $1.45 per 1,000 kWh for residential customers. Thus, FPL's UG-served customers, whose service caused far less of the storm restoration costs, are paying for the restoration costs incurred to serve OH customers. Including life-cycle costs in setting the charges for UG service will mitigate this subsidy.

Q: Can a utility's charges for UG installations, whether conversions from existing OH facilities or new UG installations, be stated on an across-the-board or average basis for all customers, applicants, and projects?

A: Yes, with qualifications. It is appropriate for a utility's tariffs to state charges on an average basis. However, it is important to note that many of the relevant cost factors have to be calculated on a case-specific basis, at least to reflect the distances of facilities that are, by hypothesis, installed underground instead of overhead. Additionally, especially because of the magnitude of the costs involved in UG projects, where conditions are significantly different than average, applicants or customers must have the opportunity to have their UG charges evaluated and collected on a condition-specific basis. The PSC's Rule 25-6.115(10), Florida Administrative Code, provides for this by allowing applicants for UG conversions to challenge the utility's cost estimates.

FPL's CHARGES FOR UNDERGROUND CONVERSIONS

Q: How should the PSC go about determining the proper CIAC charges to be charged by FPL for UG conversion projects in these proceedings?

A: The PSC should follow the basic formula stated earlier in my testimony. The PSC must also recognize that many of the factors will vary according to the specific conditions of each conversion project and be prepared to recognize credits, or debits, accordingly. For example, I have observed the overhead facilities in the Town of Jupiter Inlet Colony and can attest to the fact that they are in extremely poor condition and experience much higher than normal outage rates; accordingly, in my opinion, these facilities should be replaced in any event. Beyond that, though, many of the facilities in Jupiter Inlet Colony are rear-lot construction and are subject to interference from vegetation; to the extent that Jupiter Inlet Colony's conditions are worse in this regard than the average values upon which the average CIAC charges or credits are based, those conditions must be recognized in calculating the CIAC for Jupiter Inlet Colony's conversion project.

Stated differently, applying CIAC charges on an average-cost basis is fine for average conditions, but the CIAC charges for UG installations must recognize conditions that vary significantly from the average.

Q: Do you agree that the CIAC charges proposed by FPL for UG conversion projects are appropriate?

A: No. While I believe that FPL's Avoided Storm Restoration Cost credit for larger UG projects is reasonable, our analyses show that FPL's proposed <u>additional</u> charge <u>against</u> UG projects for "other operational cost differentials" is incorrect. Additionally, FPL's proposal to use sharply defined "tiers" for its CIAC charges is inappropriate and would result in applicants for conversion projects in the middle tier paying inappropriate CIAC charges in many cases.

Q: Why do you believe that FPL's ASRC credit for larger UG projects is reasonable?

A: FPL has proposed a credit of 25 percent of the otherwise applicable CIAC for the estimated benefits that UG facilities will provide in the form of Avoided Storm Restoration Costs. In 2006, PowerServices conducted a detailed analysis, mostly using FPL data, of the costs and benefits of undergrounding in terms of utility costs only (Exhibit PJR-2). Our analyses showed that the storm restoration cost savings were approximately 24 percent of the otherwise applicable CIAC, calculated as the difference in initial cost for UG vs. OH facilities. This is close enough to FPL's proposed value to be reasonable, at least at this time.

Q: Do you agree with FPL's assigning a storm restoration cost benefit factor of 20 percent of the maximum ASRC amount to projects of minimal size?

A: Yes. While I have not evaluated this figure in detail, it strikes me as reasonable, inasmuch as even the smallest 1-or-2-customer UG projects will provide some benefits. As explained later in my testimony, however, I do take issue with FPL's proposed charges for UG projects of intermediate size.

Q: In your previous answer, what did you mean by "utility costs only"?

A: Our primary analyses only examined costs that would be borne, or benefits in the form of cost savings that would be realized, directly by the utility in its accounts. The key distinction here is that these primary analyses did not address the real economic benefits realized through undergrounding by communities and states as a whole from reduced power outages. We did discuss that issue in a separate chapter of our 2006 Undergrounding Study, and I believe that this an important public interest factor for the Commission to consider, but it is not directly applicable to the CIAC calculations.

Q: You also stated that FPL's proposed storm restoration credit value is reasonable, at least at this time. What might cause that to change in the future?

A: The simple answer is that future storm experience, or revised projections of future storm experience or exposure, could cause that value to increase or decrease. FPL's own analyses showed that if they were to assume more frequent storms, based on recent Florida experience, the credit value should be between 31 percent and 41 percent of the otherwise applicable CIAC. If, as predicted by many meteorologists, Florida is likely to experience more frequent and stronger tropical storms and hurricanes over the next 15 to 20 years, then the credit value should be higher than FPL's 25% value. I understand that a substantial number of meteorologists believe that the North Atlantic entered its current period of increased tropical activity in 1995. As of today, I believe that FPL's ASRC credit amount of 25% for larger UG installations is reasonable, but FPL and the Commission should monitor the situation closely: one Andrew-class or Katrina-class storm could change the value significantly.

Q: Why do you believe that FPL's proposed additional charge for the estimated difference in other non-storm-related operational costs for UG projects is incorrect?

A: FPL proposes an additional charge of $11,400 per PLM for UG conversion projects; this can also be understood as a reduction from the credit otherwise given to reflect storm restoration cost savings. I believe, and our analyses indicate, that instead of an $11,400 per PLM charge, there should be additional credits of $122,189, which is approximately 14.6 percent of the otherwise applicable CIAC.

The principal components of this difference are:

a. additional outage restoration cost savings associated with weather events other than named hurricanes and tropical storms;

b. reduced vegetation management costs;

c. savings in other O&M costs; and

d. reduced accident litigation costs, including claims awards and settlements to the victims of electrical contact accidents.

Minor differences are also attributable to other O&M cost differences.

Beyond these cost differences, as mentioned in concept above, there are other factors that should be included in calculating the net cost impact on the utility and its general customer base: these include preserved revenues from undergrounding and the loss of pole attachment revenue when existing OH facilities are converted to UG facilities.

Q: Why do you believe that there are other savings from undergrounding in the form of avoided weather-related restoration costs?

A: In the first place, it is obvious that OH facilities are impacted by many more weather events than just named hurricanes and tropical storms. For example, severe thunderstorms, microbursts, and tornadoes occur in Florida and damage OH distribution facilities, though they rarely damage UG facilities. FPL's storm restoration cost analyses clearly, on their face, do not recognize other weather-related restoration cost differentials. This is shown by FPL's own exhibit (my Exhibit PJR-9) by which it developed the GAF/ASRC credit, which is based only on the costs incurred by FPL to restore service following the seven named storms that impacted FPL's service area in 2004 and 2005: Charley, Frances, Jeanne, Dennis, Katrina, Rita, and Wilma.

Our analyses indicate that an additional credit of $46,775 per pole-line mile, or approximately 5.6% of the otherwise applicable CIAC, should be provided to reflect restoration cost savings for other, non-major-storm weather events.

Q: What is the estimated savings of UG facilities from reduced vegetation management costs?

A: Our estimates indicate that undergrounding saves approximately $52,470.00 per pole-line mile in vegetation management costs based on the vegetation management cycle currently in use by FPL as approved by the PSC. This is approximately 9% of the otherwise applicable CIAC.

Q: What is the estimated savings of UG facilities from reduced costs associated with electrical contact accidents and what basis was used for these estimates?

A: PowerServices initially developed an estimate in our 2006 report using representative numbers based on the very high accident and fatality levels experienced in recent years by FPL mostly attributable to contact and other accidents associated with OH lines. In order to provide confidentiality of settlement costs, FPL has embedded these costs in the O&M numbers within their filing. Based on the relatively low impact these costs have had on the O&M costs, we have significantly reduced our estimate of reduced OH litigation and award payments to 0.87 percent of the otherwise applicable CIAC. This was developed from FPL's reported annual projected cost of $9,961,000.00 (from FPL's minimum filing requirement schedule B-21, Docket Number 080677-EI). It is clear that our original analysis based on representative values from prior experience would yield an adjustment that is overstated. Due to confidentiality agreements, specifics cannot be examined here. Appendix G of the MUUC report shows historical accident and litigation numbers for FPL from 1990 to 2006. It is important to note year to year variations including lower numbers in 2005 and 2006. I believe the only way to view this credit for undergrounding in terms of a significantly longer time period to ensure that this variability is accounted for. There is some risk going forward that the costs associated with OH contact accidents could increase significantly.

Q: **What evidence do you have to support the claim that FPL has overstated UG O&M costs and understated OH O&M costs?**

A: FPL's O&M cost calculations and analyses are flawed in the following ways: FPL's analyses by which it has attempted to justify its understated cost savings from underground facilities are systematically flawed and biased against UG facilities in several ways:

- FPL's analyses are systematically biased against UG because they are based on O&M costs for an average of all existing UG facilities on FPL's system, whereas well over half of those facilities were installed before 1990, and more than one-fourth of those facilities were installed before 1980, and new UG facilities not only utilize much better technology than 20- and 30-year old UG facilities but will also have well-below-average O&M costs simply because they are new.

- FPL's analyses are systematically biased against UG because they are based on capital replacement costs for an average of all existing UG facilities on FPL's system, whereas well over half of those facilities were installed before 1990, and more than one-fourth of those facilities were installed before 1980.

Newer UG facilities are much better than the average on FPL's system. According to information provided by FPL, more than half of its UG system was installed before 1990 and more than 25 percent was installed before 1980. Before 1980, the standards for UG installations included bare concentric neutral, polyethylene (HMWPE), and cross-linked polyethylene (XLPE) cable. After 1980, FPL stopped using bare concentric neutral and polyethylene conductor. After 1990, FPL added tree-retardant cross-linked polyethylene (TRXLPE), and those standards remain for FPL today. TRXLPE cable is widely accepted as the standard of construction today in addition to EPR cable which is expected to yield 40 plus years lifespan with satisfactory outage performance significantly better than the older cable technologies. The facilities used by FPL before 1990 are simply not as good as TRXLPE and EPR. They have higher failure rates and therefore higher operational costs. Current technology is more reliable and operates effectively for a significantly longer period of time.

Q: You also mentioned capital replacement costs as being a source of inaccuracy in FPL's estimated costs of UG facilities. Please explain.

A: Additionally, capital replacement costs are expected to be much less for UG facilities than for OH facilities: UG facilities have substantially longer lives – FPL's depreciation study shows that UG facilities have depreciation lives of approximately 34-36 years, as compared to depreciation lives of approximately 23-24 years for OH facilities. In practical terms, this means that a utility would have to replace an OH system 3 times in the same time that it would have to replace a UG system twice. This is especially true for new UG facilities using today's technology. This is consistent with my observations and experience, as well as with widely available industry information.

Q: Please explain your proposed credit to UG conversions for preserved revenues.

A: Utilities, including FPL, will experience reduced sales losses with UG facilities than with OH facilities. This will result in greater base rate revenues. Our estimate of these preserved base rate revenues is approximately $21,000.00 per PLM or about 2.5 percent of the otherwise applicable CIAC. Our supporting calculations are shown in Exhibits PJR-2 and PJR-3.

Q: Are there any offsetting factors that increase the cost to utilities and customer of having UG facilities?

A: Yes, there are two such factors: lost pole attachment revenues and "UG locates". When an electric utility such as FPL converts a section of OH facilities to UG service, it will either remove the poles or cut off their tops and leave them to any remaining telecommunications or cable television companies, with the result that the electric company will no longer get the pole rental payments that it might have been receiving from those pole attachers. Values per our 2006 study: lost pole attachment revenues $9,300/PLM and UG locates $6,540/PLM.

Q: Taking all of the above into account, what is the right value to reflect the net operational cost differences between UG and OH facilities?

A: Considering all factors, it is my opinion that the correct value to reflect the non-storm-related operational cost differences between UG and OH facilities is approximately $122,189.00 per pole-line mile. Incorporating this value into the CIAC calculation would result in an additional credit for UG conversions of approximately 14.6 percent in addition to the 25 percent proposed by FPL.

FPL'S CHARGES FOR NEW UG INSTALLATION

Q: How should FPL's charges for new UG installation (URD charges) be adjusted to reflect your estimates of the operational cost differential?

A: FPL's URD charges should be adjusted to reflect the greater non-storm-related operational cost savings from UG described in my testimony. I will furnish a supplemental exhibit showing the correct values as soon as practicable.

Q: In an earlier response, you stated that FPL's approach of using "tiers" with sharply defined breakpoints to assign charge for UG projects of different sizes is inappropriate. Please explain.

A: FPL's tiered approach is flawed and would result in unfair rates being charged to some customers in the middle tier, or "Tier 2" customers on Sheet No. 6.300. In its tariffs applicable to UG conversion projects, FPL would give the full GAF-equivalent ASRC credit for a project with 200 single-family homes or 3 pole-line miles, but would only give 40 percent of that amount for a project with 195 homes or 2.9 pole-line miles. FPL correctly recognizes the principle that larger UG projects provide greater benefits, and I agree with this principle, but FPL fails to follow through by giving appropriate credits for jobs that are between the minimum and the maximum size. FPL's approach also has the problem that a conversion job of 1.1 pole-line miles will get the same credit as the job with 2.9 pole-line miles; this is clearly out of line with the cost savings benefits provided.

Fortunately, this problem can be fixed by use of a simple arithmetic formula or table. I recommend the geometric formulas shown in my Exhibit PJR-12.

Q: Wouldn't such a formula be difficult to administer?

A: Not at all. It can be implemented and administered by use of a simple computer algorithm that reads the number of single-family homes, units, or affected pole-line miles involved, which has to be determined anyway, and then calculates the appropriate credit.

COSTS AND DURATION OF UNDERGROUND SYSTEM OUTAGES

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

A: It is true that repairing certain types of equipment or cable failures resulting in an UG outage takes longer than repairing many types of OH outages. However, with good utility practices, underground facilities are normally designed with loop feeds and therefore the actual outage duration is much shorter even though the repair time is longer. Depending upon the type of damage, the repairs may not take longer than those on comparable overhead facilities. The repair time argument is often made in the context of locating, excavating, and repairing damaged underground cable. This definitely takes longer than splicing overhead conductors. Replacement of damaged pad mounted equipment such as transformers can generally be done in a comparable time to replacing an overhead piece of equipment such as a transformer.

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

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

Q: Does this conclude your testimony?

A: Yes, it does. However, I reserve the right to revise my testimony subject to any new information coming to light.