BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

DOCKET NOS. 070231-EI & 080244-EI, FPL'S CHARGES FOR UNDERGROUND INSTALLATIONS

DIRECT TESTIMONY OF LLOYD D. SHANK, JR., P.E.

Q: Please state your name and business address.

A: My name is Lloyd D. Shank, Jr., P.E. and my business address is 8443 Foxworth Circle, Orlando, Florida 32819.

BACKGROUND AND QUALIFICATIONS

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

A: I am employed by PowerServices, Inc., as a Senior Project Manager. In my capacity as a Senior Project Manager of PowerServices, I provide a range of consulting services to various clients, including municipal and investor-owned utilities, municipalities, and private-sector companies with regard to many electric issues. For example, I advise clients on electrical engineering issues involving overhead and underground distribution facilities, and management of their utilities. I am a registered Professional Engineer in the States of Florida and North Carolina.

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

A: I am a 1972 graduate of North Carolina State University with a B.S. in Electrical Engineering. In addition, over my career, I have attended

numerous seminars, short courses, and continuing education courses in electric utility engineering and management. A copy of my resume' is included as Exhibit ____(LDS-1) to my testimony.

Q: Please summarize your employment history and work experience.

A: I have over thirty-seven years experience working in the operation and management of electric transmission and distribution systems. From 2008 to the present, I have been in my current position as a Senior Project Manger with PowerServices Inc. From 2005 to 2008, I was Project Development Manager for Florida Municipal Power Agency of Orlando, Florida. From 2000 to 2005, I served as the Director of Electric and Gas Utilities of the City of Leesburg, Florida. From 1983 to 2000, I was the Electric Utility Director for the City of High Point, North Carolina. From 1980 to 1983, I was the Assistant Director of Electric Utilities for the City of High Point, North Carolina. From 1975 to 1980 I was the Electric Utility Director for the City of Washington, NC. From 1972 to 1975 I was an Electrical Engineer in the meter department for Duke Power Company, Charlotte, North Carolina.

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

A: I have held various positions with statewide municipal power organizations in both Florida and North Carolina. In 2004, I served at the President of the Florida Municipal Electric Association. In North Carolina I had the

privilege of serving as the President of the North Carolina Association of Municipal Electric Systems.

Q: What is the primary function of Florida Municipal Electric Association (FMEA) and the North Carolina Association of Municipal Electric Systems (NCAMES)?

A: FMEA functions as a Joint Municipal Assistance Agency with 31 members in the State of Florida. FMEA provides customer service, safety training, emergency & technical assistance, and government and legal affairs services to FMEA' members. During hurricanes, ice storms, and other natural disasters, FMEA is instrumental in assisting all its members with Joint Municipal Assistance and Communications. NCAMES is a similar organization to FMEA except that the organization is entirely made up of the managers and employees of the municipal electric systems in North Carolina. The significant difference is that NCAMES is an advisory organization to ElectriCities of North Carolina. While I was President of NCAMES, we developed a statewide system of organizing response to storm related outages. I served as the western coordinator for outage response during the 1990's.

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

A: The electric utility systems I directly worked for, including those serving Leesburg, Florida, High Point, North Carolina, and Washington, North

Carolina, owned and operated both transmission and distribution facilities. The systems had both overhead and underground distribution facilities. When I began my utility career in the 1970s, the amount of underground facilities was limited, but as technology improved and costs came down, more and more distribution facilities were placed underground. All the new subdivisions built in Leesburg, High Point, and Washington, and the vast majority of municipal electric systems in Florida and North Carolina in the last twenty years have chosen underground electric distribution facilities. In both High Point and Leesburg, underground was so cost-effective that both Cities discontinued additional charges for individual underground residential house services.

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

Early in my career, I constructed and installed overhead and underground electric distribution facilities. I also supervised the response to major electric outages.

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

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

Both in High Point and in Leesburg I assisted large subdivisions who were intent on replacing the overhead lines with underground lines after experiencing the frustration of several long term outages related to the overhead lines. In Leesburg, the City adopted a long-range plan to replace all of Leesburg's overhead lines with underground lines.

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 before the City Commission of the City of Winter Park during their deliberations in considering the decision of having an underground electric system. In my long career of service to North Carolina cities, I testified many times before city commissions and councils.

SUMMARY AND PURPOSE OF TESTIMONY

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

A: I have been asked by the Municipal Underground Utilities Consortium (MUUC), the City of Coconut Creek, Florida, the Town of Palm Beach, Florida, and the Town of Jupiter Inlet Colony, Florida, to testify regarding the likely operational and capital replacement costs associated with new underground (UG) facilities as compared to overhead (OH) facilities.

Q: Please summarize your testimony.

A: It has been my experience, as a manager and supervisor responsible for power restoration during all types of inclement weather, that underground electric facilities are far superior to overhead facilities in terms of overall reliability, reliability in major storms, reduction in restoration costs, reduction in normal O&M costs, public safety, and reduction in lost revenues. Although the impact of these outages to the electric distribution system has significant costs the far greater cost is the economic impact to the communities, individuals, and businesses who suffer the outages. These economic impacts include both lost production and lost wages.

I was a Utility Manager in 2004 when the State of Florida was hit by four hurricanes in the same year. In the City of Leesburg not a single electric customer lost electric service because of their underground service in the storms. However, the majority of the customers experienced outages because of failures in the overhead electric system. Because I was also

responsible for the Leesburg gas customers I was aware that just a hand full of gas customers state wide experienced gas outages during these same storms. Of course, all of the gas systems are underground.

From my personal experience, it is my opinion that in normal circumstances, the long-term costs of operating and maintaining UG distribution facilities will be less than the comparable O&M costs for OH facilities. It is also my opinion that UG facilities will perform significantly better than OH facilities in terms of failures and the need for capital replacements. Accordingly, I believe that the long-term costs to utilities and their customers, including FPL and its general body of customers, will be reduced through the installation of UG facilities; accordingly, I also believe that FPL's estimates that claim to show that the long-term O&M costs and long-term capital replacement costs for UG facilities are higher than for OH facilities are erroneous.

LONG-TERM COSTS OF UNDERGROUND VS. OVERHEAD DISTRIBUTION FACILITIES

Q: Please summarize your familiarity with operating and replacing UG and OH facilities.

A: As I mentioned above, I worked directly for electric utilities for approximately 30 years, as a utility director. Throughout my working life, I have worked directly with both UG and OH distribution equipment and systems. My experience includes installing, repairing, and replacing both

UG and OH facilities, supervising crews doing that work, and managing utility systems that undertake that work.

Q: From your experience, what is your opinion regarding FPL's estimates regarding projected O&M costs and capital replacement costs for UG vs. OH distribution facilities?

A: FPL's analyses, reflected in Mr. Koch's Exhibit TRK-4, claim to show that the long-term O&M and Capital Expenditure costs of new UG facilities installed today would be substantially greater than the corresponding costs for OH systems. From my experience, I believe that this conclusion is incorrect. I believe that the opposite is true, and that the projected O&M costs and capital replacement costs for UG costs should be less than those for OH facilities. I also believe that, in real life, the O&M and capital costs for UG facilities will be less than the corresponding costs for OH facilities.

Q: Are these same considerations applicable to FPL's charges for new UG facilities through its URD charges?

A: Yes. I do agree with FPL that the long-term O&M cost differentials and capital replacement costs between UG and OH facilities should be less for new construction, because most new OH construction is in front-lot locations and also because most new construction is better protected from vegetation than existing OH facilities. From my experience, I doubt that the differential is as great as the 50 percent assumed by FPL, but since I haven't analyzed this issue, I don't have a different suggestion.

OTHER CONSIDERATIONS

Q: Are there other considerations that are relevant to utilities' and regulatory commissions' consideration of charges for undergrounding?

A: Yes. There are very good reasons that underground distribution service is, in the real world, the standard of service for new distribution facilities. It is obviously preferred by customers for reliability and aesthetic reasons. Underground facilities are also preferred by utilities for the reliability and cost-savings benefits that they provide. For example, I don't believe that it is an accident that more than 63 percent of FPL's customers (as shown on FPL's Exhibit TRK-1, Page 36 of 196) are served from UG facilities, nor that FPL has been adding UG line to its system at a much greater rate than OH line.

Additionally, UG facilities provide long-term benefits in terms of reduced risks associated with distribution facilities. Such benefits include: greatly reduced cost risk from major storms and other weather events; greatly reduced cost risk from corrosion and other damage to OH systems that result from exposure to the elements; virtually eliminated cost risk from vegetation contact; virtually eliminated cost risk from animal contact; virtually eliminated risks of injuries to persons from contact with energized facilities; and virtually eliminated risks of damages to motor vehicles from crashes with distribution poles.

Finally, as I mentioned above, UG facilities are significantly more reliable in hurricanes and tropical storms, and in the more ordinary severe summer thunderstorms that utilities in both North Carolina and Florida experience, than OH facilities. This greater reliability translates directly into fewer outages and reduced total customer outage time. This further translates into better service and reduced customer losses due to power outages, especially prolonged outages due to major storms.

All things considered, utilities and their customers strongly favor underground facilities, and regulatory commissions should take the above factors into account and promote undergrounding for the reliability and cost-savings benefits that it provides.

Q: What about the risk of "washouts" in coastal areas? Does this change your opinions?

A: Like most people who work with electric distribution facilities, both underground and overhead, I am familiar with the unusual event of a "washout" of underground facilities in extreme storm surge events. However, it is my experience that these events are very unusual, and accordingly, the possibility of washouts does not alter my opinions and conclusions as stated in my testimony.

My specific experience while I was Utility Director in both North Carolina and Florida is that underground facilities, especially where they

are properly designed, installed, and maintained, suffer minimal permanent damage from flooding and virtually none from other storm related issues.

CONCLUSIONS

Q: Please summarize the major conclusions of your testimony.

A: I believe that underground electrical distribution is far superior, in terms of operating costs, reliability, and public safety, to overhead electrical distribution in areas prone to wind and ice storm outages. Underground distribution is environmentally more compatible with our needs to reduce the nation's carbon level. Furthermore, I believe that underground distribution will have an overall more positive benefit to local economies.

Q: Does this conclude your testimony?

A: Yes, it does.

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LLOYD D. SHANK, JR., PE
SENIOR PROJECT MANAGER

PROFESSIONAL EDUCATION

North Carolina State University, Raleigh, NC
B.S. Electrical Engineering –1972 – With Honors
TAU BETA PI Engineering Honor Society

REGISTRATION:

Professional Engineer: North Carolina - # 07960
Florida - # 56515

EXPERIENCE:

2/2008-Present

Senior Project Manager
POWERSERVICES, INC.
Raleigh, North Carolina

Florida Resident Engineer – Responsible for managing and leading consulting activities within the State of Florida.

2005– 3/2008

Project Development Manager
FLORIDA MUNICIPAL POWER AGENCY
Orlando, Florida

Responsible for oversight of the construction of a 30 MW peaking project and a 300 MW combined cycle power project. Planned and initiated a second combined cycle power project.

In collaboration with other FMPA staff, authored a "Project Execution Plan" which is being currently edited for APPA.

2000 - 2005

Director of Electric and Gas Utilities
CITY OF LEESBURG
Leesburg, Florida

Managed a 9000 customer gas system and 21,000 customer electric system. While in Leesburg, the fiber optic system was expanded by 90 miles and communication profits increased from $125,000 to over $1,000,000 per year. Managed projects in fiber optic system construction, substation construction, transmission line construction. Produced long range system construction and capital plans for both

gas and electric utilities. Developed a long range plan to underground the entire City electric system. Organized a cooperative effort of seven public and private utilities to share common trenches on both sides of a 3½ mile highway widening project. While there, the City became one of the first APPA member Cities to qualify for and receive the APPA RP3 (Reliable Public Power) Award. Received the City's "Sterling Award" for managing and expediting the recovery of power after experiencing two direct hurricanes in the same year.

Served as President of the Florida Association of Municipal Electric Systems
Five years on the Board of Directors of Florida Association of Municipal Electric Systems
Four years on the Board of Directors of Florida Municipal Power Agency

1980 – 2000

Director of Electric Utilities
CITY OF HIGH POINT
High Point, North Carolina

Managed a 34,000 customer electric system. While in High Point, the City experienced growth from 103 MW peak demand to 224 MW. The successful response was in large part due to a long range capital and financial plan I implemented. While there, I managed the construction of four new city substations, renovations and additions in seven substations, the extension of over thirty miles of 69 kV and 100 kV transmission, and an additional 100 kV delivery point. The delivery point was tied to the existing 100 kV transmission loop through a dual 100 kV underground feed extending 2800 feet. All of the above work was constructed by City forces without a bond issue.

I also bring to PowerServices many years of experience with construction and maintenance of major underground systems. Being home to the International Home Furnishings Market, High Point downtown features a major underground electrical network. I experienced extending this network of duct banks, manholes, and vaults. Some unique experiences were locating transformers in rooms on various floors of buildings and roofs of multi-story buildings. During my tenure in High Point, I was also responsible for all aspects of customer service for all the City's utilities. My experience includes rate studies and development of customer service polices. Being aware of the need for demand side management, I implemented energy auditing services and a 14,000 voluntary customer load control program. My experience in High Point also includes implementing a utility wide SCADA system.

In my years in High Point, I honed my abilities in managing system recovery after storms. In twenty years the system experienced ice storms and wind storms, including a hurricane and a tornado.

LLOYD D. SHANK, JR., PE
(Continued)

Also during these years, I served as President of the North Carolina Association of Municipal Electric Systems and many years on the Board of Directors of North Carolina Municipal Power Agency including the position of Secretary /Treasurer. I also served terms on the Board of Directors of ElectriCities of North Carolina

1975– 1980

Director of Electric Utilities
CITY OF WASHINGTON
Washington, North Carolina

At the time of my tenure, the Washington system consisted of 14,000 customers. The system had circuits as long as 26 miles in one direction and 19 miles in the other. At the time, these long circuits were served from a 4,160 volt system. Through system planning and engineering, I was able to show the improvement in system integrity and revenue through lower losses associated with a higher voltage. I was commended in a resolution by the Town of Washington Park for my actions in improving system reliability.

1972-- 1975

Electric Engineer
DUKE POWER COMPANY
Charlotte, North Carolina

Served in the Plant and Transmission Meter Department under the Transmission Division of Duke Power Company. I managed the test program for all metering installations served from the transmission lines of Duke Power Company, including major industrial customer meters. I supervised three meter test men for which he was responsible for monitoring meter performance and scheduling tests. I was also responsible for calculating compensation factors for both inductive and capacitive losses in conductors and devices in the major transmission interties between Duke and other Power Companies.

PROFESSIONAL AFFILIATIONS:

Institute of Electrical and Electronic Engineers (IEEE-PES)
Served as President of the North Carolina Association of Municipal Electric Systems
Many years on the Board of Directors of North Carolina Municipal Power Agency including the position of Secretary /Treasurer.
Served terms on the Board of Directors of ElectriCities of North Carolina