ORIGINAL

BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

In re: Review of Florida Power Corporation's Earnings, Including Effects of Proposed Acquisition of Florida Power Corporation by Carolina Power & Light

DOCKET NO. 000824-EI

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DIRECT TESTIMONY
OF
ROBERT A. SIPES, P.E.

ON BEHALF OF
FLORIDA POWER CORPORATION

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DIRECT TESTIMONY OF ROBERT A. SIPES, P.E.
ON BEHALF OF FLORIDA POWER CORPORATION

I. Introduction

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

A. My name is Robert A. Sipes. I am Director of Distribution Operations and Support for Florida Power Corporation ("Florida Power" or "the Company"). My business address is 3300 Exchange Place, Lake Mary, Florida 32746.

Q. What are your duties and responsibilities?

A. I am responsible for the management of the staff organizations that provide support to the region organizations that construct, operate, and maintain Florida Power's distribution system.

Q. Please describe your educational background and work expertise.

A. I obtained a Bachelor of Science degree in Electrical Engineering from North Carolina State University in 1983. I joined Carolina Power & Light Company ("CP&L") in 1984 as an associate engineer working in the Distribution Standards work group located in Raleigh, N.C. In 1986 I moved from the Distribution Standards staff job to hold several different field-engineering positions in and around the Raleigh area. In these positions I was directly involved with the construction, operation, and maintenance activities associated with CP&L's distribution system. In 1994 I was named as the Engineering Supervisor in CP&L's West Raleigh District Office. In 1995 I was named as the Region

Engineering Manager in CP&L's Western Region based in Asheville, N.C. In 1997 I was promoted to the position of General Manager in the Western Region. In 1999 I was asked to lead a team to coordinate the integration activities associated with the acquisition of Florida Power by CP&L. The areas of focus for our team were transmission and distribution. I assumed my current position with Florida Power in 2000.

II. Purpose and Summary of Testimony

Q. What is the purpose of your testimony?

A. I appear on behalf of Florida Power to discuss the Company's commitment to distribution system reliability and to support the reasonableness of the Company's Capital and Operation and Maintenance ("O&M") expenses in the distribution area.

Q. Have you prepared any exhibits to your testimony?

A. Yes.

RAS-1 is a Distribution Reliability Justification schedule, showing our Capital and O&M projections for the respective distribution reliability initiatives, as well as a detailed description of each reliability initiative.

Q. What schedules in Florida Power's MFRs do you sponsor?

A. I sponsor or co-sponsor Schedules C-8, C-19, C-20, C-21, C-52, C-57, and C-61. These are true and correct, subject to their being updated in the course of this proceeding.

Q. Please summarize your testimony.

A. Florida Power remains committed to maintaining a reliable and cost-effective distribution system and, to that end, applying the latest technology to meet our customers' needs and changing expectations. Increasingly, our customers are becoming more sophisticated in their use of technology in their own business and personal affairs, and hence more demanding in what they expect of their investor owned electric utility. At the same time, we are benefiting from an impressive variety of technological tools that better enable us to serve our customers and to enhance the reliability of our distribution system.

In the early 1970s, Florida Power broke new ground by introducing the cutting-edge automated Trouble Analysis System, improving its ability to detect, isolate, and remedy problems that might affect the reliability of service to customers. Over the last three years, the Company has once again introduced a number of technological break-throughs and initiatives to stay abreast of the latest tools available to the industry and to anticipate, meet, and even exceed what customers demand of the Company, including Delivery System 2000 ("D2K"), encompassing a variety of state-of-the-art technological systems and programs. We are aware that our customers are increasingly demanding fewer and shorter

interruptions in electric service that may affect computers and other digital equipment. We are meeting these demands, and we are committed to continue to do so as we move forward into Florida Power's second hundred years as a Florida utility.

In this light, we believe that the Capital and O&M distribution program we are proposing for the test year is very reasonable and necessary to enable us to continue to provide the service that our customers expect and to improve upon areas within our service territory that may fall short of our mark and our customers' expectations. Identified within the Capital and O&M program are a number of initiatives that will ensure that Florida Power provides the world-class service that our customers rightfully demand and expect. In addition, we are pleased to say that our recent merger, resulting in the creation of Progress Energy, Inc. ("Progress Energy") and the achievement of significant synergies among Florida Power, CP&L, and Progress Energy Service Company, LLC ("Progress Energy Service"), has enhanced the ability of the Company to take full advantage of best practices in the area of Energy Delivery, including distribution, and to control our operating costs going forward.

III. Historical Perspective

Q. Please provide us with an overview of steps the Company took since its last rate case to maintain distribution reliability.

A. The Company has kept pace with customer growth over the years, it has consistently provided reliable and cost-effective distribution service, and it has promptly identified and resolved challenges to system reliability. One indicator of system reliability is the System Average Interruption Duration Index ("SAIDI"), which measures the duration of service interruptions. This is a more meaningful indicator for distribution service than transmission because a transmission service interruption, while short in duration, may impact a greater number of customers. Historically, the Company has attempted to maintain this index at or about 100 minutes. Although the Company's SAIDI numbers rose in 1995, Florida Power introduced a number of initiatives that succeeded in reducing its index numbers back to historic levels, spending approximately $86 million (in Capital and O&M costs) on its system. These initiatives included stepped-up efforts to inspect, treat, and replace distribution poles; increased efforts in tree trimming throughout the system; implementation of the Supervisory Control and Data Acquisition system ("SCADA") in Florida Power's more rural territory (enhancing control over breakers and restoration of feeders), and Selective Corrective Reliability Engineering ("SCORE") in both the coastal and central regions. In fact, the Company has made a commitment to invest in its transmission and distribution system even further in the coming years to meet our goal of improving our SAIDI numbers by 20 percent for distribution and 15 percent for transmission over the next three years in order to meet rising customer expectations.

Since the last rate case, the Company has maintained its continuing commitment to utilize the latest technology for the benefit of its customers by implementing a number of initiatives, including:

- *D2K (Delivery 2000) system.* This is a three-year initiative, started in 1999, to improve job efficiencies and customer service through advanced technology and delivery systems. Once completed, Florida Power will have invested approximately $23 million in this technology. Five different technology systems comprise this initiative: Geographic Information System ("GIS"); the Work Management System ("WMS"); the Outage Management System ("OMS"); the Mobile Outage Management System ("MOMS"), and Reliability Centered Maintenance ("RCM").
    - GIS uses a proven software package that benefits engineering, drafting, and line personnel by providing more legible and usable information, replacing paper maps (showing streetlights, poles, and primary and underground facilities).
    - WMS is a design, estimating, and scheduling tool that is used to manage construction projects from beginning to end. WMS generates efficiencies through design templates, work forecasting, and tracking. It also offers up-to-date status and financial data on specific projects. WMS integrates with the GIS system and accounting systems to automate data management associated with construction activities.

- OMS replaced the Company's Trouble Analysis system, a pioneering automated system first launched in the 1970s. OMS is based on the public safety 911 dispatch system. It integrates with the GIS system and presents all distribution facility information associated with an outage in a visual format, related to local geographic features such as roadways, etc., to enable Company dispatchers to coordinate outage restoration quickly and effectively.
- MOMS provides field personnel with mobile computing terminals in their vehicles that receive outage tickets, via the OMS system, from distribution dispatchers. MOMS also provides field personnel with visual mapping information similar to that available to dispatchers.
- RCM allows better tracking of all maintenance performed on the Florida Power system and offers a tool for predictive maintenance.

- *Field Order Dispatch System.* This is a system costing approximately $1 million to deploy that is used to route service calls efficiently and to provide better information on a real-time basis to call center representatives concerning the status of service. By implementing this system, the Company was able to reduce routing time, back-tracking, dispatching errors, personnel needed to complete field order processing, paper flow (approximately 5,200 sheets per day), overtime

for field and support employees, and radio traffic. The Company was also able to enhance the ability of employees to reach assistance in an emergency, to collect reconnect fees on services sooner, and to schedule work to serve customer requests.

- *Supervisory Control and Data Acquisition ("SCADA").* The Company expanded this system at a cost of $1 million to permit centralized control of breakers and restoration of feeders. We now have remote control over virtually every feeder in our system.
- *International Drive Corridor ("I" Drive).* This first-of-a-kind system costing approximately $4 million employs relay technology on the Company's underground distribution feeder system serving the densely populated International Drive corridor in the heart of Orlando's tourist district. The system identifies faults and reroutes service without customers' ever experiencing an outage.

Q. Have these efforts been effective in improving the reliability of the Company's distribution system?

A. Yes, they have. As a result of these and other core infrastructure initiatives, the Company has kept abreast of its growing system and customer base and has responded successfully, overall, to rising customer expectations in the area of system reliability. Although the Company has faced greater challenges in certain areas within its service territory due to unusual demands (e.g., demand attributable to extraordinary density in the International Drive corridor) or natural

factors (e.g., interference from trees in rural areas or older, established neighborhoods), Florida Power has responded to these challenges by redoubling its efforts to ensure that all customers receive reliable and adequate electric service, wherever they reside.

For example, the Company undertook the "I Drive" project to strengthen the reliability of its feeder system serving the International Drive corridor, reflecting its commitment to take all reasonable measures to anticipate, meet, and even exceed customer expectations. Florida Power serves approximately 500 commercial customers in this premier vacation area. With a 45 MW peak load, these customers expect a high level of electric service reliability. Yet, the distribution system that had served these customers since 1984 had begun to experience chronic outages. In 1998, the system had 16 feeder-level outages that affected a large number of customers, many of whom considered only one outage every three to four years a reasonable level of service. After searching for methods to provide reliability in this area, the Company developed two key initiatives: (1) A near-term initiative, replacing approximately 27,000 feet of underground cable. This was completed in the first quarter of 1999. (2) A long-term, strategic initiative, which led to a unique distribution automation solution, focused on reducing the duration and frequency of outages in the area through the use of readily available switching equipment, plus a multiplexed fiber-optic system. From the time of its initial conception, the distribution automation system became fully operational in approximately one year.

Q. How much has Florida Power invested to maintain the reliability and integrity of its transmission and distribution infrastructure since the Company's last rate case?

A. Approximately $.8 billion in O&M and $1.6 billion in capital.

Q. What steps do you take to monitor and control costs within the functional areas under your management?

A. Throughout the Company, including Energy Delivery and particularly distribution, we engage in rigorous cost evaluation and control for all capital expenditures and O&M costs. Our overarching goal is to improve reliability while reducing costs. Within each business unit, including Energy Delivery, budgets and recommendations are developed by staff based on targets keyed to historical spending and, increasingly, by metrics designed to drive functional units to desired performance levels. All proposals and requests must be supported and defended through a rigorous peer review process, subject to management approval. Expenditures are carefully evaluated based on a "balanced scorecard" approach, taking into account the potential impact on financial goals and constraints, customer service, organizational integrity, and operational benefits. An example of this "balanced scorecard" analysis is set forth as part of Schedule C-57d to our MFRs (p. 237).

Budget requests and recommendations are then processed through the respective business units in the Company for further review and analysis.

Distribution, transmission, and customer accounts each report to Energy Delivery, which will evaluate and prioritize budget proposals from each of these functional areas. Energy Delivery, in turn, must support and defend its proposed Capital expenditures and O&M expenses in relation to competing demands of other business units. Energy Delivery has designated project review groups to assist in reviewing and prioritizing projects. As part of this process, Energy Delivery will rank the various projects being considered and work closely with the project review groups to review Capital and O&M costs to stay within budget in both areas.

In addition, the Company employs teams called "Progress Teams" (modeled after the very successful GE work-out process) comprising cross-sections of employees from various business units, to perform what is in essence a self-audit function, seeking opportunities to improve processes, reduce costs, create efficiencies, develop solutions for operational or other problems, and to work with vendors, contractors, and Company personnel to ensure that new projects are undertaken in a cost-effective manner.

IV. Proposed Distribution Costs

Q. Please provide an overview of the distribution O&M program that Florida Power is proposing in this proceeding in order to maintain and enhance the reliability and integrity of the Company's distribution system.

A. As shown in MFR Schedule C-57, Florida Power forecasts that it will spend approximately $97 million in O&M costs in 2002. This amount is net of $5.5 million in savings resulting from the merger. In addition, we are undertaking increased reliability initiatives that contribute to the total $7 million variance from benchmark and are reflected in our budget for 2002. Taking into account these new initiatives and the merger synergies, we are forecasting a total favorable variance of $1.5 million from the benchmark amount of $98.7 million.

Although I will not repeat here the more detailed explanation of our proposed distribution reliability initiatives and their attended costs in Schedule C-57d, by way of summary they include reduction of lightning-induced outages, removal of trees impacted by drought conditions in recent years, improvement of fuse overcurrent protection coordination, expansion of infrared inspections, inspection and replacement of deteriorating transformers, identification and correction of problem feeders, improvement of feeder performance, management of vegetation, enhancement of the Company's data mapping system to ensure the integrity of the data, and replacement of mobile computers in service vehicles. We have also included in the Schedule a "Balanced Scorecard" listing various distribution initiatives that we will be undertaking.

Q. Please describe the merger synergies that you are forecasting for 2002 for Energy Delivery, in Florida.

A. As a result of the merger, we are now able to integrate and consolidate Energy Delivery functions between Florida Power and CP&L by eliminating or reducing functions that are redundant between the two utilities, particularly where staffing levels do not depend upon the miles of transmission or distribution lines in our system. Also, we are now able to take advantage of volume discounts in making equipment purchases in these areas. Further, in implementing best practices from CP&L, we are now looking at life-cycle costs for transmission and distribution equipment and incorporating this analysis into our vendor bidding processes, which may result in greater short-term costs in some instances but lower long-term costs of running these systems. Overall, we project that we will reduce costs for 2002 by $5.5 million in the area of distribution alone.

Beyond measures to cut costs, the merger has enabled us to draw upon the best practices of both CP&L and Florida Power to enhance reliability in areas that will not be reflected directly in lower Capital or O&M numbers. As discussed by Mark Myers in his Direct Testimony filed September 14, 2001, we are proposing to enhance the quality of system reliability in a number of ways, as a result of the merger, including:

- *Increased investment in reliability.* We are shortening replacement intervals for parts with a high likelihood of failure; increasing the automation, coordination, and self-correcting capabilities of the transmission and distribution system; we are further segmenting the

system to improve our ability to isolate faults; and we are adding equipment that will enable us to identify and locate faults quickly.

- *Improved Outage Response.* We have announced a special 1-800 number to enable customers to report outages promptly, and we have implemented new technology that will allow up to 1,000 additional phone lines to be available to our customers for outage reporting and the provision of information in the event of a major storm. We are partnering with customer service centers in the Carolinas to share resources when major storms or outages occur, leveraging the resources of the combined companies to provide greater service to Florida customers. We will be able to call upon CP&L to provide back-up in the event of storms and other disasters. Employees from both companies will use compatible equipment systems enabling CP&L workers to integrate seamlessly with Florida Power response teams.
- *New Fleet of Vehicles.* Based on our best practices evaluation, Florida Power is investing more than $60 million over the next three years for new Energy Delivery vehicles. A newer fleet means less unscheduled maintenance and better reliability for Florida Power's work crews, which enables overall customer service.
- *New Dispatch Radio System.* Florida Power will be investing over $14 million in a new radio system for use throughout our service territory. This will increase reliability and coverage and reduce interference

from radio users and paging companies. This will also give us the ability to orchestrate talk groups for transmission and distribution crews during normal work assignments within the Florida Power system and will allow Florida Power crews to talk to each other anywhere in our system. In addition, because we are using the same radio system as CP&L, our crews will be able to coordinate with CP&L crews during major restoration events.

- Adapting CP&L's best practices, we are adding four new operating centers across our service territory to place Florida Power line, service, engineering, and management resources closer to customers, improving response time and reliability.

Q. Are the transmission and distribution costs proposed for 2002 reasonable?

A. Without a doubt. As I have described, the Company has exercised careful stewardship over the past 10 years, investing approximately $.8 billion in O&M and $1.6 billion in new capital in order to balance the cost of service and the reliability of its system, expending resources when reasonable and cost-effective to maintain acceptable levels of system reliability. The Company utilizes a rigorous process of cost review, control, and containment to ensure that all projects we undertake are necessary, reasonable, and cost-effective. We are not striving to achieve unrealistic levels of reliability. At the same time, however, it is imperative that we serve the evolving needs of our customers as their usage

patterns change and that we take steps needed to maintain the integrity of our equipment and our responsiveness to service interruptions when they do occur.

Q. Does this conclude your testimony?

A. Yes, it does.

Florida Power
A Progress Energy Company

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RAS-1
WITNESS: ROBERT A. SIPES, P.E.

Distribution Projects

#	Project	O&M ($ in 000's) 2002	2003	2004	Total	Capital ($ in 000's) 2002	2003	2004	Total	Total All
	Safety & Environmental									
1	Underground Cable Replacement	$ -	$ -	$ -	$ -	$ 8,010	$ 8,010	$ 8,010	$ 24,030	$ 24,030
2	Transformer Replacement & Inspection Program	500	500	500	1,500	1,000	1,000	1,000	3,000	$ 4,500
3	Replace Deteriorating Poles	-	-	-	-	1,900	1,900	1,900	5,700	$ 5,700
		$500	**$500**	**$500**	**$1,500**	**$10,910**	**$10,910**	**$10,910**	**$32,730**	**$34,230**
	Optimized for Reliability Improvement									
4	Fusing Coordination	650	650	650	1,950	-	-	-	-	$ 1,950
5	Overhead Fault Indicators	-	-	-	-	435	435	435	1,305	$ 1,305
6	Midpoint Recloser	-	-	-	-	3,732	3,732	3,732	11,196	$ 11,196
7	Infrared Inspection	258	258	258	774	420	-	-	420	$ 1,194
8	Small Diameter OH Wire	-	-	-	-	1,636	1,636	1,636	4,908	$ 4,908
9	Feeder Lightning Arresters	-	-	-	-	1,643	1,643	1,643	4,929	$ 4,929
10	Branch Line Lightning Arresters	-	-	-	-	3,130	3,130	3,130	9,390	$ 9,390
11	Add Sectionalizers	-	-	-	-	478	478	478	1,434	$ 1,434
12	Loop Sectionalizers	-	-	-	-	2,058	2,058	2,058	6,174	$ 6,174
13	Spacer Cable	-	-	-	-	2,297	2,297	2,297	6,891	$ 6,891
14	Additional Automation	-	-	-	-	2,773	2,773	2,773	8,319	$ 8,319
		$908	**$908**	**$908**	**$2,724**	**$18,602**	**$18,182**	**$18,182**	**$54,966**	**$57,690**
	System Intergity									
15	Targeted Feeder Analysis	1,909	1,909	2,614	6,432	2,871	3,341	4,036	10,248	$ 16,680
16	Feeder Performance Improvement Program	600	600	600	1,800	2,400	2,400	2,400	7,200	$ 9,000
17	Vegetation Management	1,621	1,621	1,621	4,863	240	240	240	720	$ 5,583
18	System Contingency Improvements	-	-	-	-	4,757	4,757	4,757	14,271	$ 14,271
19	Automated Meter Reading	-	-	-	-	1,490	1,494	1,508	4,492	$ 4,492
20	Data Mapping Enhancements	705	705	-	1,410	545	545	-	1,090	$ 2,500
21	Mobile Data Computers	705	705	-	1,410	545	545	-	1,090	$ 2,500
		$5,540	**$5,540**	**$4,835**	**$15,915**	**$12,848**	**$13,322**	**$12,941**	**$39,111**	**$55,026**
		$ 6,948	**$ 6,948**	**$ 6,243**	**$ 20,139**	**$ 42,360**	**$ 42,414**	**$ 42,033**	**$ 126,807**	**$ 146,946**

Capital and O&M Budget for Distribution Reliability Initiatives

Introduction

Florida Power Corporation (FPC) is committed to providing stellar electric service to the customers and communities it serves. And while the company's past performance has delivered on that promise, FPC still seeks opportunities to improve further. As a result the company is now intensifying its customer focus to meet customer needs in the 21st century. Toward that end, the company must upgrade the energy delivery infrastructure that has served customers well for decades. Adding to the strength of these efforts are two key corporate values: (1) a commitment to excellence and (2) a willingness to do what is necessary to achieve increased service levels for an ever-expanding customer base. Translating a philosophy to improve into realized results requires funding levels that will drive this customer-centered approach to higher levels of performance. Changes in energy user technologies, the proliferation of electronics in homes and businesses, and changes in the electric utility industry itself have all increased the importance of reliability and service quality in the delivery of electric service to customers.

Progress Energy is achieving world class performance because of its relentless commitment to the improvement of business processes that affect key performance indicators. But dramatically increasing customer expectations demand vigilance, and Progress Energy's goal is to meet and even exceed those high expectations.

Physical Environment - Florida

In recent years two physical phenomena have significantly impacted FPC's electric operations: the normal, high incidence of lightning and ongoing drought conditions in the state.

Lightning

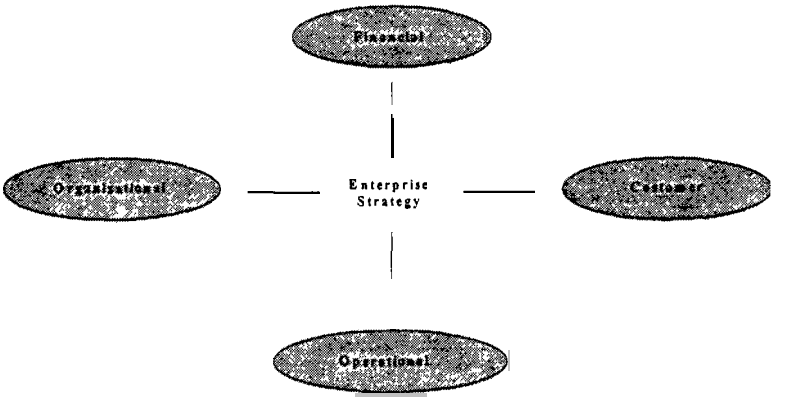
Lightning in FPC's territory is the most intense in the United States -- data provided by the U.S. National Lightning Detection Network indicate that many areas in the service territory receive an average of 16.0 flashes/square kilometer/year - the highest category recorded (based on 10-year average 1989-1998). FPC provided information to the FPSC earlier for the "IOU Lightning Protective Comparative - Initial Document Request" detailing its planning process for system protection of the transmission, distribution, and substation systems. In that document, the company outlines in Attachment D mechanisms by which lightning damage and resulting interruptions might be minimized if funding were available to undertake the indicated programs. Critical to achieving improved customer service performance is funding initiatives to reduce these lightning-caused outages.

Drought

While lightning flashes continue to impact electric operations, drought conditions in recent years (especially since 1997) create additional funding requirements for improving customer service levels for the power delivery system. Drought affects trees in ways that generate more outages attributable to them as they affect transmission and distribution line performance. Drought Severity Indices available from NOAA indicate that for the period ending July 7, 2001, a majority of the state of Florida is experiencing moderate to severe drought (only Northern Florida and the panhandle areas are experiencing near normal conditions). Even if drought conditions ease in future months, trees already impacted by these previous conditions will continue causing outages in the future unless affected ones are identified and potential problems eliminated. Funding is necessary to pursue an aggressive, proactive program to remove danger trees resulting from drought.

Power Quality & Reliability Initiatives

FPC is using a "balanced scorecard" approach to measure plan performance. In addition to traditional financial performance measures, the inclusion of additional measurement indicators ensures a balanced assessment of program performance. The following model conveys FPC's approach:



This measurement method provides a means to cover the critical measures of success in implementing the power quality and reliability strategy and improving performance. Each of the four categories will contain specific measures that provide information on financial performance, system and process performance, safety and employee performance, and customer loyalty and satisfaction. The customer area in particular provides measures that will provide an external perspective of the impacts of improvement efforts.

Reliability Improvement Initiatives Portfolio

The following is a description of each initiative proposed for improving the reliability of the distribution system.

1. Update Fusing Coordination – O&M = $0.7 million and Capital = $0

Initiative Description: This initiative is focused on improving fuse overcurrent protection coordination on the distribution system. Fuses are used to sectionalize faulted branch lines and prevent larger level outages on the power system. There are two strategies used in fuse protection schemes, fuse save and fuse blow. Fuse blow schemes allow the fuse to blow without tripping the upstream breaker or protective device. This reduces momentary interruptions to all customers on a circuit but produces a sustained interruption for all faults, temporary or permanent, occurring on the power system. Fuse Save schemes are based on the principal that 80% of faults on an overhead power system are temporary and will be cleared by opening the upstream breaker, allowing the fault to clear, and then reclosing the breaker. The fuse does not blow, no sustained outage occurs, and all customers on the circuit experience a momentary interruption (blink). When this scheme fails to perform properly the result are both a momentary interruption to all customers on the circuit and a permanent outage to the customers downstream from the fuse (the worst of both worlds). This program plans a recoordination of feeder overcurrent protection schemes to implement fuse save operation wherever it is achievable.

Cost: Costs are estimated at $300 per location for refusing.

Benefit: The assumption for benefits uses the annual average CMI over the past 3 years for fuse outages associated with unknown or storm/wind outage causes. Benefits are summed by feeder in a Pareto sorted analysis. Actual benefits will probably be larger since most animal caused fuse outages are also temporary. Program effectiveness is estimated at 50% with a high of 70% and low of 30%. This is due to the technical limitations for achieving fuse save operation in higher fault current zones. Fuse locations/feeder are estimated at 52 with a low of 30 and a high of 70.

2. Faulted Circuit Indicators – O&M = $0 and Capital = $0.4 million

Initiative Description: Faulted Circuit Indicators (FCI's) are devices placed on a feeder conductor to detect fault currents from downstream faults. When the device senses that a fault occurred downstream, it flashes a bright LED. This flashing LED is seen by patrolmen and used to reduce patrol time to locate faults. They are typically installed at major splits or taps on the main feeder circuit. The model assumes 4 FCI locations per feeder.

Cost: Cost for 3 devices (3-phase installation) is estimated at $600.

Benefit: The assumption is a 6-minute reduction in restoration time for each feeder outage, which results in an average improvement of 6000 CMI per feeder. The variables are a reduction time minimum of 3 minutes, maximum of 10 minutes and an effectiveness of 50% to 80% with an average of 70%.

3. Midpoint Reclosers – O&M = $0 and Capital = $3.7 million

Initiative Description: This initiative involves installing reclosers at roughly the midpoint of the main feeder protective zone. These are large 3 phase reclosers capable of serving feeder level loads. The reclosers prevent outages to upstream customers from downstream faults on the main feeder.

Cost: The installed cost of each recloser is estimated at $23,000, with a low of $20,000 and a high of $25,000. The initiative assumes one recloser per feeder at roughly the midpoint of customers served by the feeder.

Benefit: The assumed benefit is a 20% reduction in CMI from feeder level outages. The actual CMI for each feeder is based on analysis of feeder level outages and annual average performance over the last 3 years for each feeder. The feeders are then sorted in Pareto fashion (worst to best) and used to estimate the benefit based on number of feeders implemented in the initiative. An assumption of overall effectiveness ranging from 90% to 100% is also included.

4. Expand Infrared Inspections – O&M = $0.3 million and Capital = $0.4 million

Initiative Description: This initiative calls for Infrared Inspection of the main feeder backbone areas to proactively find and correct potential problems which would, unless detected and repaired, result in outages. Experience has shown this to be an effective method of detecting and locating problems such as bad connections, overheating switches and other problems, which generate a thermal signature.

Cost: This initiative includes purchase of Infrared cameras and equipment to conduct inspections of the feeders. Labor and vehicle costs as well as repair costs are included. Estimates are for total costs per feeder to approach $3850.

Benefit: Benefits are based on total annual SAIDI of 6.5 minutes for this type of cause.

5. Small Diameter OH Wire – O&M = $0 and Capital = $1.6 million

Initiative Description: This initiative focuses on reconductoring small wire branch lines (primarily protected by reclosers, fuses or sectionalizers) with 1/0 conductor. Many cases are reported where the outage results in burndown or breakage of small (#6 copper and # 4 aluminum) wire which is pitted and burned from previous faults. The downed conductor results in extended repair time. Replacement of the conductor will not prevent outages but should reduce outage durations.

Cost: Costs for reconductoring are largely dependent on length of the line. These costs were estimated at $50,000 for a recloser line and $10,000 for fuse and sectionalizer lines.

Benefit: A Pareto sorted table of devices with wire related causes was derived from the past 3 years outage data. CMI estimates were derived from this table. Program effectiveness is estimated at 65% with a range of 50% to 80%.

6. Feeder Lightning Arresters – O&M = $0 and Capital = $1.6 million

Initiative Description: Arrester protection is a must for lines in Florida's lightning environment. Arrester spacing is a factor in the protection level provided and closer spacing of arresters should result in reduced flashovers and therefore reduced faults due to lightning. A study recently conducted on 30 feeders at Commonwealth Edison shows a 20% reduction in lightning caused outages from reducing arrester spacing from one-quarter mile to one-eighth mile. This study is the only study available to date where the lightning exposure before and after the arrester installations was factored into the performance benefit. Florida Power currently uses a quarter mile spacing guide which is the same as most utilities across the United States. The improved lightning protection plan has two initiatives:

1. Arresters to Prevent Feeder Outages
2. Arresters for Branch Line (B/L) outages.

Cost: The cost per location is estimated between $300 and $400 with nominal cost of $350 per location. Number of locations is 4 per mile. Feeder outage data was used to develop a Pareto sorted list of feeders experiencing lightning caused outages over the last 3 years. The mileage of feeder size conductors for each circuit is used to estimate the number of installations.

Benefit: The CMI reduction is estimated similar to the cost using a Pareto sorted list of CMI by feeder for those feeders experiencing lightning caused outages over the past 3 years. Program effectiveness is estimated at 20% with a minimum of 15% and maximum of 40%.

7. Branch Line Lightning Arresters – O&M = $0 and Capital = $3.1 million

Initiative Description: See initiative above.

Cost: The cost per location is estimated at $175. Number of locations is 4 per mile.

Benefit: The CMI reduction is estimated similar to the cost using a Pareto sorted list of CMI by branch line for those branch lines experiencing lightning caused outages over the past 3 years. Program effectiveness is estimated at 20% with a minimum of 15% and maximum of 40%.

8. Additional Sectionalizing – O&M = $0 and Capital = $0.5 million

Initiative Description: This initiative seeks to reduce the size of outages by reducing the number of customers per fuse. Analysis of the outage data for the past 3 years shows 618 fuse locations with over 100 customers/fuse/phase. The program will reduce the average customers/fuse on these devices from 120 to 60.

Cost: Achieving this objective may require use of reclosers or other devices at an increased cost over fusing. The costs are estimated at $3000 per location with a minimum of $2500 and a maximum of $4000.

Benefit: The CMI reduction will average 2970 per fuse with a minimum of 2000 CMI and a maximum of 4000 CMI per location. Program effectiveness is estimated at 80% with a range of 70% to 90%.

9. Loop Sectionalizing – O&M = $0 and Capital = $2.0 million

Initiative Description: This initiative calls for placing a recloser with Loop Sectionalizing (LSS) control at the tie point to another feeder. The scheme is limited to circuits where midpoint reclosers are already installed. The result is to automatically restore half the customers on the affected feeder with a net CMI reduction of 20%. This initiative operates on loss of voltage sensing and does not require SCADA control or communications. These schemes are 30 years old and the techniques are well proven. Capacity limitations can reduce the number of locations where this plan is feasible. These locations will require use of newer control schemes such as "Intelliteams," which will limit the transfer to periods where load is within capacity limits of the alternate feeder.

Cost: Costs are estimated at $25,000 per location with a range of $20,000 to $30,000.

Benefit: LSS CMI reduction is estimated at 15% with a minimum of 5% and a maximum of 25%. Overall effectiveness is estimated at 90% with a range of 80% to 100%. Benefits are derived from a Pareto sorted table of feeder outages based on average CMI for the last 3 years.

10. Spacer Cable – O&M = $0 and Capital = $2.3 million

Initiative Description: Despite 4 years of intensive tree trimming, trees remain a major cause of feeder level outages, accounting for 20% of all feeder outages in the last 3 years. Most of these outages are due to limbs falling from high tree canopy or from entire trees falling into the line. This initiative calls for reconductoring the feeder to spacer cable or installing other protective covering such as the MVLC manufactured by Raychem and recently tested at FPC.

Cost: An average of one mile (maximum of 1.5 miles and minimum of 0.5 miles) section of feeder is to be treated for mitigation. Cost is estimated at $130,000 per mile.

Benefit: CMI is based on Pareto sorted data from the last 3 years for tree related feeder level outages. Effectiveness is estimated at 40% with a minimum of 30% and a maximum of 50%.

11. Additional Automation – O&M = $0 and Capital = $2.8 million

Initiative Description: This initiative calls for installing SCADA controlled switches in each feeder. The switches, along with accurate fault indication and remote communications could be used to further sectionalize feeder outages and provide additional mitigation of feeder outages.

Cost: Costs are estimated at $12,000 per location. Locations per feeder are estimated at an average of 3 with a minimum of 0 and a maximum of 5.

Benefit: Benefits are based on Pareto analysis of feeder outages from all causes during the past 3 years. These units are estimated to provide an 18% reduction in feeder level CMI. This is based on a 5-minute restoration time.

Safety & Environmental – O&M = $0.5 million and Capital = $10.9 million

The initiatives proposed in this portion of the Reliability Improvement Initiatives Portfolio will help mitigate some safety and environmental issues associated with distribution equipment that has been negatively impacted by the harsh Florida environment. Whereas the impact to system SAIDI would be

minimal with implementation of these initiatives, there would be a noticeable improvement in the level of service provided to the customers of Florida Power though a reduction in the number of multiple outages occurring behind protective devices.

The following is a description of each of the initiatives proposed for eliminating a safety or environmental concern to the public.

1. Replace Aging Underground Cable - O&M = $0 and Capital = $8.0 million

Initiative Description: This initiative involves replacing aging underground cable that was installed on the Florida Power's system during the 1960's and 1970's. The cable manufactured and installed prior to the 1980's was constructed using what is known as a "concentric neutral". This means the underground cable was manufactured by encasing the conductor in a polyethylene jacket with the neutral wire wrapped around the outer casing in a spiral motion. Over the past 30+ years, this concentric neutral has deteriorated due to the soil conditions in which it was installed. The cable installed in conduit has also experienced an infiltration of water that over time has corroded the concentric neutral to the point that is has eroded away in various places. This deteriorated or missing concentrate neutral basically removes the grounding effect needed to ensure that shocking hazards are not present. Without this neutral, there potentially exists a voltage differential between a person standing on the ground and any device they may be touching that is connected to the electric utility system. In simple terms, someone could get shocked if they reached out and touched a metal object (such as water faucet) that is grounded to the main electrical entrance of the residence or business and the concentric neutral on the underground cable serving the building has corroded away. The shock is not deadly but is uncomfortable when encountered.

In addition to the safety concerns associated with the deterioration of the concentric neutral, the harsh Florida environment is also causing this cable to fail at a rate higher than industry standard. By replacing all cable manufactured prior to 1980, the customers should see an improvement in the quality of service provided to them.

Cost: The cost to replace primary cable ranges from $15 per foot for feeder cable to $12 per foot for URD (underground residential distribution) cable. The total cost of this initiative is approximately $24 million over a three-year period.

Benefit: The benefit is an elimination of a potential shocking hazard to the general public. As this older cable is replaced, there will be a minimal benefit from reduced outages as a result of replacing aging underground cable that is failing.

2. Inspect and Replace Deteriorating Transformers – O&M = $0.5 million and Capital = $1.0 million

Initiative Description: This initiative involves the implementation of a program to inspect underground pad-mounted transformers and identify those found to be rusting or in need of other repairs as a result of the harsh environment in Florida. An analysis of the distribution system indicates that 38% of the pad mounted transformers serving underground facilities are over 20 years old. After sitting in the harsh Florida environment for that period of time, these transformers have experienced deterioration that in some cases has led to the transformers rusting before the end of their useful life. As the rusting gets worse, the sides of the transformer may rust away and could potentially leave the conductor terminations inside of the transformer exposed. Small animals could come in contact with these exposed terminations resulting in an outage to customers. The potential also exists for humans to come in contact with these exposed terminations as well and cause possible injury. By replacing these rusting transformers, the potential for an oil spill is also eliminated.

Cost: This initiative will be implemented over a three-year period and will cost approximately $4.5 million (O&M and Capital)

Benefit: The benefits of this initiative is the elimination of a potential injury to the public should someone come in contact with exposed terminations inside of a transformer that has rusted out. An additional benefit could be a reduction in outages associated with small animals making contact with these exposed transformer terminations. There is also a benefit to the environment by eliminating a potential oil spill from a rusting transform spilling its contents into the soil or possible waterway.

3. Accelerate Pole Replacements – O&M = $0 and Capital = $1.9 million

Initiative Description: This initiative will accelerate replacement of deteriorating poles found in previous feeder inspections that were identified as being unsafe to climb and needed replacing. Should these poles fall, they could cause outages but the most significant impact would be as a safety concern with the general public and especially with FPC employees.

Cost: This initiative will cover a three-year period and cost approximately $6 million to replace deteriorated poles identified in recent feeder inspections.

Benefit: There would be a minimal benefit to reducing customer outages but the most significant benefit is the elimination of a potential safety hazard to the public and FPC employees.

System Integrity – O&M = $5.6 million and Capital = $12.8 million

The initiatives proposed in this portion of the Reliability Improvement Initiatives Portfolio will help improve the infrastructure of the distribution system providing service to the customers of Florida Power. The measurable impact on system SAIDI would be minimal but the customers would see an improvement in their overall level of service through a reduction in the number of outages experienced each year and the average time taken to restore service after an outage.

The following is a description of each of the initiatives proposed for making enhancements to the distribution system that will improve the infrastructure and provide a better quality of service to the customer.

1. Targeted Feeder Analysis – O&M = $1.9 million and Capital = $2.9 million

Initiative Description: This initiative involves patrolling of the feeders to identify items that pose the greatest risk of failure. These patrols consist of a contractor visiting each pole on the feeder and recording all devices that need replacing because of age, condition, or upgrading to current construction methods.

Cost: The cost to patrol a feeder and repair problems found averages approximately $18,000 a feeder. Over a three-year period, approximately $17 million will be spent to patrol feeders and make changes needed to correct problems found.

Benefit: The benefits of this initiative are not easily measured in reductions in CMI. If proper maintenance is completed there should be some level of improvement in reliability and at worst, it should not decline. This is analogous to replacing the oil and oil filter in an auto every 3,000 miles or replacing the engine every 50,000 miles.

2. Feeder Performance Improvement – O&M = $0.6 million and Capital = $2.4 million

Initiative Description: This initiative involves the systematic review of the feeder design to ensure it is operating at the performance level intended with the initial design and construction. This involves periodic review of loading levels on the feeder, voltage levels along the feeder, protective coordination, loss

analysis, and reliability analysis. This initiative is different from the Targeted Feeder Analysis, which involves a patrol of the feeder and fixing problems found. This initiative is aimed at ensuring the feeder meets the criteria under which it was initially designed.

Cost: The cost to perform a study on a feeder and make changes averages approximately $15,000 a feeder. This initiative is expected to cost approximately $9 million over a three-year period.

Benefit: The benefits of this initiative are not easily measured in reductions in CMI. It is anticipated that a reduction in momentary and extended interruptions along with improved voltage quality will improve the quality of service provided to customers.

3. Vegetation Management – O&M = $1.6 million and Capital = $0.3 million

Initiative Description: This initiative proposes a program for mowing or herbiciding underneath distribution lines not encompassed by the tree pruning maintenance program, removing dead and danger trees resulting from the drought, and removing or repruning those "cycle busters" that are growing faster than the scheduled maintenance times. "Cycle busters" are typically trees that have been pruned properly but will grow back into the line before the next trim cycle comes around.

Cost: Mowing/herbiciding is expected to cost approximately $1,227 per mile and will cover 1,778 miles of line. Danger tree removal is expected to cost approximately $64 per mile and cover 27,000 miles of primary distribution line. The last phase of the program will involve removing/repruning cycle busters, which will cost approximately $27 per mile for the 27,000 miles of primary distribution lines. The total initiative is expected to cost approximately $6 million over a three-year period.

Benefit: Whereas the impact to system SAIDI is minimal, the benefits are expected to include fewer outages, fewer blinks, and increased safety for service and contract crews.

4. System Contingency Improvements – O&M = $0 and Capital = $4.8 million

Initiative Description: This initiative involves analyzing the distribution system and planning for contingencies should a catastrophic failure of a substation or feeder occurs.

Cost: This initiative has identified 42 projects whereby a failure of an existing feeder or substation could potentially overload other feeders and/or substations resulting in a significant number of customers experiencing long outages. These initiatives are estimated to cost $14 million over a three-year period.

Benefit: The benefits of this initiative are not easily measured in reductions in CMI since they involve a contingency plan should a catastrophic event occur resulting in the loss of a feeder or substation.

5. Automated Meter Reading – O&M = $0 and Capital = $1.5 million

Initiative Description: This initiative involves the installation of approximately 870 electric meters that have the ability to be read remotely. This implementation is aimed at Commercial and Industrial customers above 500kW in load.

Cost: The cost to install these meters is approximately $4.5 million over a three-year period.

Benefit: The benefits of this initiative are not easily measured in reductions in CMI. These AMR meters have the ability to report outages without the customer having to call in, which should help identify outages sooner and get repairs started and completed in shorter times that currently experienced. These meters can also be read remotely which should reduce meter reading costs especially in those hard to read locations.

6. Data Mapping Enhancement – O&M = $0.7 million and Capital = $0.5 million

Initiative Description: This initiative involves making enhancements to the data mapping system to ensure the integrity of the data.

Cost: The cost to make these enhancements will be approximately $2.5 million over a two-year period.

Benefit: The benefits of this initiative will have a minimal impact on CMI but will have a bigger impact on ensuring data integrity and in some cases ensure that service crews respond to the proper location of trouble.

7. Mobile Computers in Service Vehicles – O&M = $0.7 million and Capital = $0.6 million

Initiative Description: Florida Power currently has about 300 mobile computers installed in service vehicles throughout the system. These computers are used by servicemen to complete service orders and receive new service orders as they enter into the system. This platform has been a key element in the overall efficiency of the field service organization. Recently FPC has experienced an increase in the number of mobile computers failing beyond what was felt to be normal wear and tear. This initiative is being proposed to replace the existing mobile computers with the next generation of rugged devices.

Cost: The cost to install these meters is approximately $2.5 million over a two-year period.

Benefit: The benefits of this initiative are not easily measured in reductions in CMI. It is expected to have a positive impact on the efficiency of the serviceman, which may impact the response time to outages. The overall quality of service provided to FPC customers should continue to rise as these existing mobile computers are upgraded.