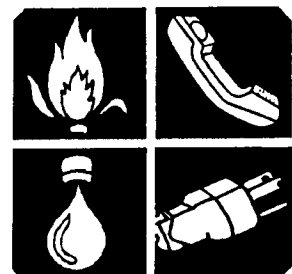


Review of
Electric Service Quality and Reliability
at Florida Power & Light Company
and Florida Power Corporation

Everett “Butch” Broussard
Senior Management Analyst II
and
Louis J. Yambor
Management Review Specialist

November 2000

By Authority of
The State of Florida for
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1.0 EXECUTIVE SUMMARY

1.0 Executive Summary

1.1 Objectives

In 1997, staff conducted a review of distribution service quality and reliability and issued a report entitled *Electric Service Quality and Reliability*. The 1997 report noted declines in reliability and service quality at Florida Power & Light Company (FPL) and Florida Power Corporation (FPC). Staff recommended a follow-up review be conducted during 1999 to assess the results of remedial programs instituted by both companies. The Bureau of Regulatory Review sent initiation letters to each company for the review in April 1999. Field work was conducted between May and November of 1999. The objectives for the review were to:

- ◆ Conduct a follow-up review of electric distribution service quality and reliability to determine efforts by both companies and document results achieved.
- ◆ Review systems in distribution, engineering, maintenance, trouble complaints, and customer satisfaction.
- ◆ Review and evaluate the two companies' performance improvement plans and assess results indicated by reliability and service quality performance measures.
- ◆ Identify and document any changes in performance measure calculation methodology.

1.2 Scope

This review includes a report of the quality of service provided to end-users by the distribution organizations of Florida Power & Light Company and the Florida Power Corporation. The specific time period examined was primarily the years 1998 and 1999 and, in some cases, the last quarter of 1997 for the major indicators. In some instances, 1992-1997 indicators and data are also shown for clarity. Staff considered both the documented results of utility activities and descriptions of planned, implemented, or partially-implemented activities relevant to distribution service quality. In determining whether service quality had improved over the study period, staff focused on the following information sources:

- FPSC-required reliability data
- Reliability indicator data internally-monitored by the utilities
- Organization and service quality activities
- Improvement plans, expenditures, and allocations
- Customer complaints to the FPSC
- Customer inquiries to the utilities

- Customer satisfaction survey results compiled by the companies
- Recent trends and changes in competition and restructuring

1.3 Methodology

This review was based upon information gathered through document requests and interrogatories, interviews with distribution department personnel, examination of company policies and procedures, and analysis of quantitative service quality indicators monitored by the companies and the FPSC. Particular attention was paid to verifiable progress, quality indicators, and changes in utility practices that have affected current service quality and what may affect it in the future.

1.4 Overall Opinion

Staff's 1997 review indicated that a reduction in distribution service quality occurred at both Florida Power & Light Company and Florida Power Corporation over the period 1992 through 1996. Both organizations recognized the need for extensive efforts aimed at improvement and targeted areas where the most significant improvements could be made.

FPL posted improvements in nearly all areas of measurement since the issuance of staff's 1997 report. Although budgeted dollars for reliability-related programs during 1999 were down from 1997 and 1998 levels, the related reliability indicators generally indicate improvement.

FPC has had notable improvement that started in 1997 and has progressed through year-end 1999. SAIDI, which measures the average duration of an outage, has improved. CAIDI, which reflects average restoration time, has also improved in 1999 as well as SAIFI, which measures the frequency of the outages. The conclusion is that FPC customers are experiencing shorter outages, fewer outages, and the response is quicker. Overall, an average FPC distribution customer has experienced improved distribution system reliability.

This review notes progress and systematic improvement by both FPL and FPC. As shown on the following page, in most instances outage indicators such as SAIDI, CAIDI, and SAIFI show recovery trends that are positive and indicate fewer outages of shorter duration. Both utilities documented improvement in customer complaints, customer satisfaction, spending on distribution projects, and service restoration. Maintenance dollars for ongoing and short-term projects have been budgeted to continue the efforts of the past two years. In sum, the two companies experienced improvement in most facets of reliability of distribution service from 1997 through the end of 1999.

Distribution Reliability Comparison 1997 -V- 1999		
	FPL	FPC
Measurement or Application	Improvement Y / N	Improvement Y / N
SAIDI (System Average Outage)	Y-Down 45%	Y-Down 17%
CAIDI (System Average Time)	Y-Down 29%	Y-Down 4.8%
SAIFI (System Average Frequency)	Y-Down 23%	Y-Down 13%
L-BAR (System Average Length of all Interruptions)	Y-Down 13%	N-Up 3.8%
Customer Satisfaction	Y-Up 8.5% - Continuous Uninterrupted Power through 1998 Service Restoration Up 3.6% through 1998	Y-Up 1%-Energy Delivery
Over all Reliability Dollars Expended	Y-Up 33% through 1998	Y-Up 10% through 1998
Changes in Budgeted Dollars for 1999	N-Down 4% 1998-v-1999	Y-Up 21% 1999-2001
PSC Service Complaints	Y-Down 60%	Y-Down 22%

2.0 BACKGROUND AND PERSPECTIVE



2.0 Background and Perspective

2.1 1997 Electric Service Quality Report

Staff's 1997 report presented a detailed summary of service quality on the four major electric companies. The report identified trends in service quality for each company from 1992 through 1997. Additionally, the report documented the efforts by each company to promote reliability, to handle customer complaints, and to resolve customer property damage claims. The narrative also briefly summarized the significance of service quality, the emergence of electric industry competition, performance based regulation, and efforts by state regulators to monitor reliability.

Staff's 1997 report, presented the following seven conclusions:

- ◆ ***Enhancement of Reliability Reporting Mechanisms.*** The reliability indicators established by Rule 25-6.0455 should be expanded to be more comprehensive.
- ◆ ***Improvement Goals and Action Plans.*** Both Florida Power & Light (FPL) and Florida Power Corporation (FPC) had indications of a decline in service reliability.
- ◆ ***Follow-up Review of Improvement Results.*** One or more follow-up reviews on actions taken by FPL and FPC should be conducted to assess actions taken and the results of those actions. Follow-up reviews may also gather information on additional problems identified or additional plans and programs developed to improve distribution reliability and service quality.
- ◆ ***Service Quality and Reliability Standards.*** If adequate improvement doesn't take place, service quality benchmarks and/or standards should be considered by the Commission.
- ◆ ***Assessment of Adequacy of Florida Public Service Commission (FPSC) Rules.*** Clearer guidelines on the handling of customer complaints to the Commission should be established and defined.
- ◆ ***Customer Education.*** Reductions in customer inconvenience and property damage could be achieved through heightened efforts by the FPSC and the electric utilities via public service announcements and other educational materials.
- ◆ ***Customer Property Damage Claims Monitoring.*** Processes for handling customer property damage claims should be investigated by staff.

The actions taken as a result of the 1997 review are discussed below.

2.1.1 Changes to FPSC Distribution Service Reliability Report

In an attempt to gather uniform information on service reliability, the Commission requires each utility to file a Distribution Service Reliability Report (Rule 25-6.0455) with the Commission by March 1 of each year. This report has been required since 1993. Each report covers the preceding calendar year and includes the following information:

- ◆ The utility's total number of service interruptions (N) categorized by cause.
- ◆ The average length of service interruptions experienced (L-Bar).
- ◆ The utility's three percent of feeders with the highest number of feeder breaker interruptions, identified by number, substation, and general location. Additionally:
 - Number of customers in each service class served by the feeder
 - Number of service interruptions (N)
 - Average length of service interruption (L-Bar)

Utilities are required to categorize each interruption as one or more of the following causes:

- ◆ Lightning
- ◆ Tree or limb contacting line
- ◆ Animal
- ◆ Line downed by vehicle
- ◆ Dig-in
- ◆ Substation outage
- ◆ Line transformer failure
- ◆ Salt spray on insulator
- ◆ Corrosion
- ◆ Other
- ◆ Unknown

To avoid skewing the data as a result of events beyond the control of the utility, the FPSC's definition of service interruptions excludes those caused by the following:

- ◆ Momentaries
- ◆ Circuit breaker operations
- ◆ Hurricanes
- ◆ Tornados
- ◆ Ice on lines
- ◆ Planned load management
- ◆ Electrical disturbances

Graphs and other exhibits throughout this report are presented net of the effect of these items unless otherwise stated.

In response to the 1997 report's conclusions, in March 1998 and 1999, the companies filed the expanded reliability report including SAIDI, CAIDI, SAIFI, and MAIFIE. These measures are defined as follows:

- ◆ **System Average Interruption Duration Index (SAIDI)** is also known as “Service Unavailability” or “Customer Minutes of Interruption.” This index measures the average length of interruptions, usually in total minutes, experienced by all customers served on the system over a period of time, usually a year. SAIDI is calculated by dividing *total customer hours of interruption* by *total customers served*. An upward trend in SAIDI is normally perceived as a reduction in reliability.
- ◆ **Customer Average Interruption Duration Index (CAIDI)** measures the average time duration, usually in minutes, before service was restored to customers experiencing an interruption. CAIDI is calculated by dividing *customer hours of interruption* by the *number of customer interruptions*. An upward trend in CAIDI is normally perceived as a decrease in reliability.
- ◆ **System Average Interruption Frequency Index (SAIFI)** measures the average number of interruptions of all customers served by the system over a period of time, usually a year. This index is a reflection of reliability as it relates to system design. SAIFI is calculated by dividing *customer interruptions* by *customers served*. An upward trend in SAIFI is generally perceived as a reduction in reliability.
- ◆ **Momentary Average Interruption Frequency Index (MAIFIe)** This index is very similar to SAIFI, but it tracks the average frequency of momentary interruption events (usually defined as interruptions of less than one minute in duration).

As suggested in the 1997 report, the Division of Electric and Gas in July 1998 requested that the investor-owned utilities expand reliability reporting. The utilities agreed to voluntarily submit the four indicators of SAIDI, CAIDI, SAIFI, MAIFIe, and data on multiple customer interruptions along with the Annual Distribution Reliability Report required under Rule 25-6.0455. This reporting approach has continued for three years using annual workshops to review progress on standardization of index calculation and to discuss any problems the companies may have encountered.

2.1.2 Review of Customer Property Damage Claims Process

In response to the Bureau of Regulatory Review’s audit recommendation regarding customer property damage claims, in September 1998, the FPSC’s Division of Electric and Gas requested that the Bureau of Regulatory Review (BRR) conduct a review of claims handling at the four major power companies. Staff’s report, entitled *Electric Customers’ Property Damage Claims* was published in July of 1999. The report described three issues as discussed below.

According to that report, all four companies needed to increase customer awareness of the right to file a claim. None of the companies had offered specific information to customers on claims rights and procedures. Secondly, the report pointed out the need for these companies to investigate beyond their current procedures, specifically in the Continuity of Service Tariff area. Third, the study analyzed sample data to conclude no patterns of payment discrimination existed in customer property damage claims handling.

2.1.3 Changes in FPSC Customer Complaint Handling

In the area of customer complaints, the need to further refine the process was noted. The Division of Electric and Gas and the Division of Consumer Affairs agreed in 1998 that complaints regarding outages, damage claims, and meter tampering would be handled directly by Division of Electric and Gas staff. In 1999 and 2000, the FPSC underwent an internal reorganization resulting in all complaints now being handled by its Division of Consumer Affairs. Customer complaints are discussed further in Section 2.2.2.

2.1.4 State and Federal Regulatory Activity

At this writing, twenty-four states have introduced retail electric competition into their electric utilities. All states are under pressure, especially in the generation of electric power, to take a hard look at the issue of restructuring. Further, at least 12 states, including Florida, have introduced or strengthened their reliability regulations. In the past two years, Commissions and legislators in the states of Colorado, Connecticut, Massachusetts, Ohio, Illinois, and Texas have adopted rules for reliability criteria to protect the consumer. These states add to a growing list of states that have mandated restructuring and implemented certain management controls. The state actions address the following customer service concerns:

- ◆ Complaint Resolution
- ◆ Reliability Monitoring
- ◆ Consumer Education

At the federal level, on April 15, 1999, a Congressional proposal was released that calls for states to implement retail competition by January 1, 2003. Additionally, it called for a repeal of the Public Utilities Regulatory Policies Act of 1978 and the Public Utility Holding Company Act of 1935. The report apparently spurred Congress into action.

On June 8, 1999, a proposed bill entitled "Electric Consumers Power to Choose Act of 1999" (H.R.2050) was introduced on the floor of the U.S. House of Representatives. Among other conditions, it would mandate states to implement retail competition by January 1, 2002. Currently, this bill is in the Water & Power Subcommittee. Additionally, two more Senate Bills (S.Rs. 2071 & 2098) were filed in February 2000. Both bills address power restructuring, and both bills are now in the Committee on Energy and Natural resources.

These anticipated changes are modifying the way investor-owned utilities are doing business. Utilities are currently preparing for competition by reducing their costs, restructuring, shifting costs, and instigating mergers.

2.2 Performance Trends

2.2.1 Recent Interruption Reports

Exhibits GEN-1 and GEN-2 display the trends in numbers of interruptions experienced by FPL and FPC in their Distribution Service Reliability Reports over the period of 1992 through 1999.

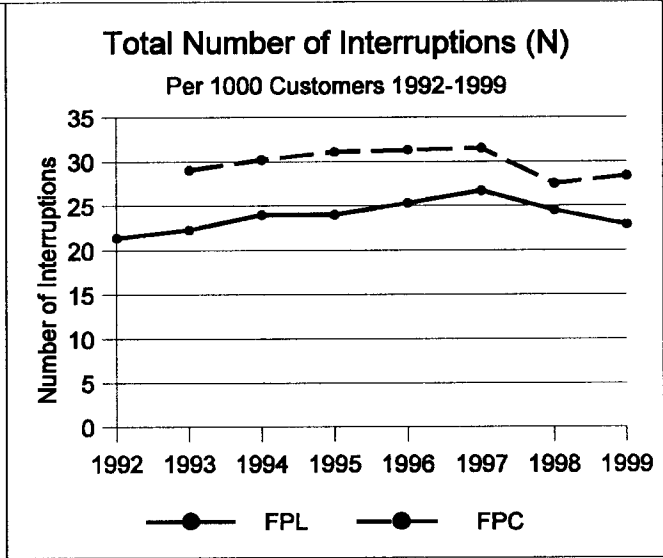
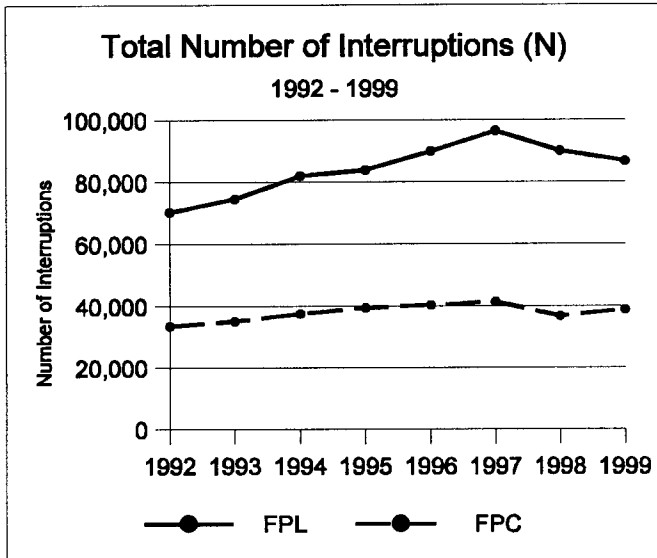


EXHIBIT GEN-1 Source: FPSC Reliability Reports.

EXHIBIT GEN-2 Source: FPSC Reliability Reports, Statistics of The Florida Electric Utility Industry.

Exhibit GEN-1 shows the trend in actual total interruptions, while Exhibit GEN-2 equalizes for the size differences between these companies by presenting the interruption data on a per 1,000 customer basis. **Exhibit GEN-3** displays the trend in average duration of interruptions (L-Bar) over the 1992 through 1999 period. Since 1997, the duration index at FPL has declined by 21 minutes, while FPC's duration index has increased by four minutes. The calculation of L-Bar provides a simple average of all interruptions, but it does not provide a "weighting" to adjust for the number of customers interrupted.

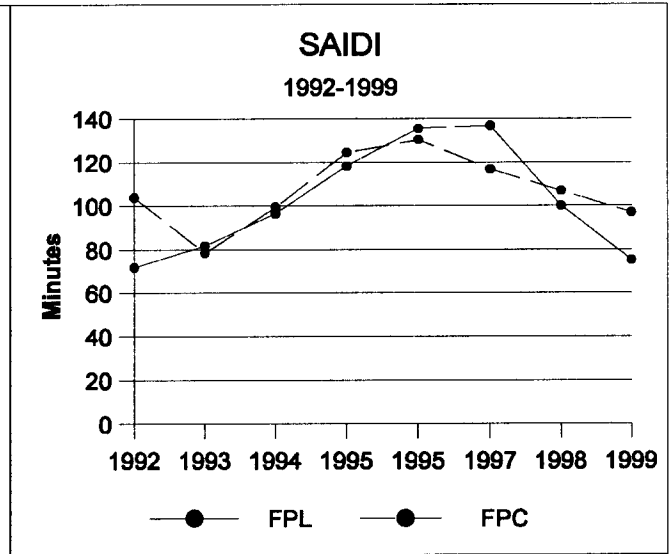
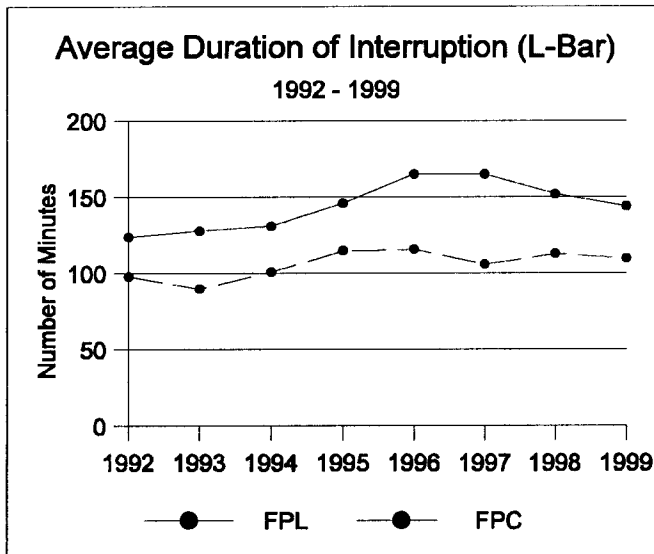


EXHIBIT GEN-3 Source: FPSC Reliability Reports.

EXHIBIT GEN-4 Source: FPSC Reliability Reports

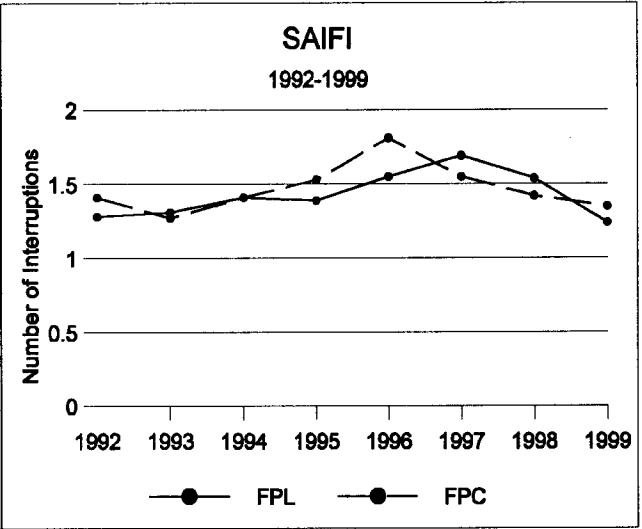
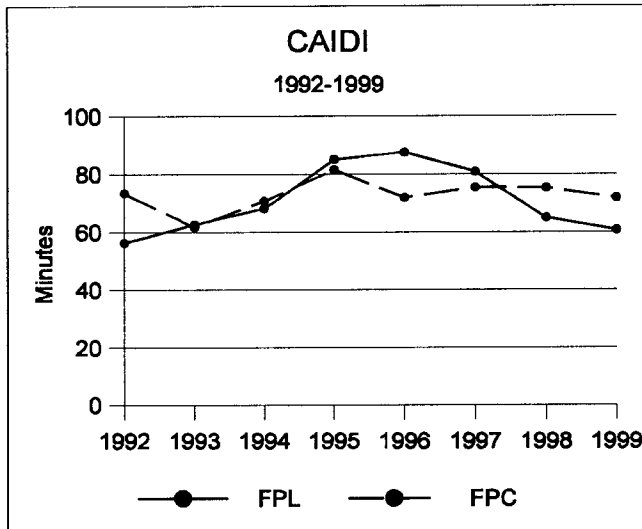


EXHIBIT GEN-5 Source: FPSC Reliability Reports **EXHIBIT GEN-6** Source: FPSC Reliability Reports

In Exhibits GEN-4, 5, and 6, both company improvements are shown in a seven-year history of SAIDI, CAIDI and SAIFI. In particular, using a window of comparison for 1997 versus 1999 within GEN-4, it is noted that SAIDI for FPL has dropped 45 percent and FPC has declined 17 percent. In GEN-5, CAIDI for FPL has declined by 29 percent and FPC's by just under five percent. SAIFI, as shown in GEN-6, reflects a decline of 23 percent for FPL and 13 percent for FPC. These graphics are presented in more detail in FPL and FPC's individual chapters.

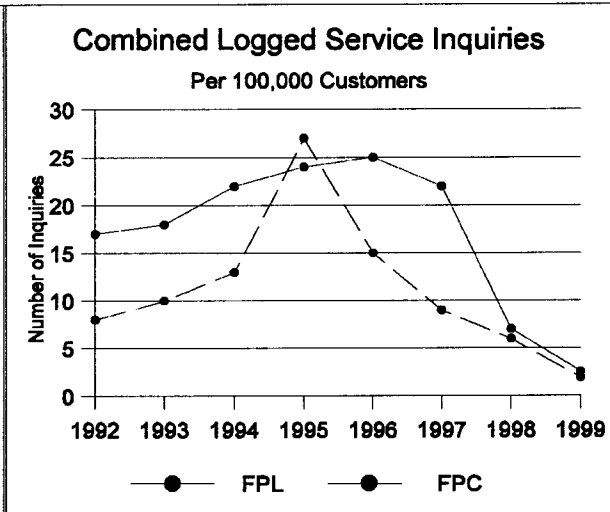
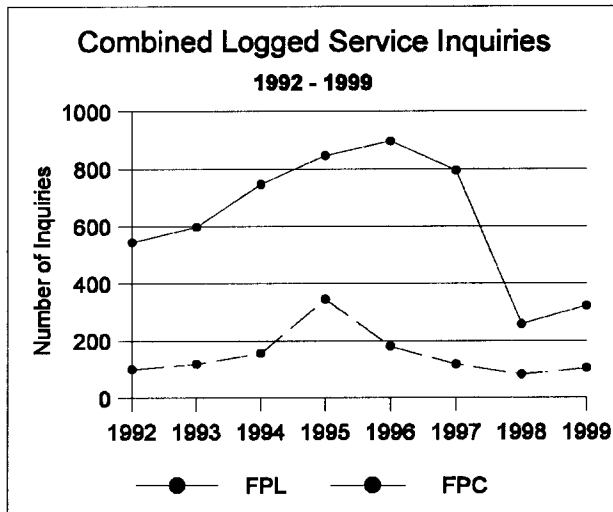


EXHIBIT GEN-7 Source: FPSC Division of Consumer Affairs 1992-99.

EXHIBIT GEN-8 Source: FPSC Division of Consumer Affairs & Statistics of the Florida Electric Utility Industry.

2.2.2 Recent FPSC Consumer Complaints

Exhibits GEN-7 and GEN-8 respectively show the total number of electric service-quality complaints and service-quality complaints per 100,000 customers received by the Commission between the years 1992 and 1999. Total combined service complaints declined sharply for FPL from 1997 levels, although year-end 1999 did post a slight increase from the 1998 low. FPC's levels also declined in 1998, with a corresponding slight increase for 1999. Combined logged service complaints per 100,000 customers have declined significantly for both companies from 1997 through 1999 when compared to previous years. At year-end 1999, the two companies were almost equal in combined logged service complaints per 100,000 customers. A detailed analysis of all service-related customer complaints for each company can be found in report section 3.2.1 for Florida Power & Light and 4.2.1 for Florida Power Corporation.

2.2.3 General Utility Information

Exhibit GEN-9 provides general information relating to FPL and FPC. FPL is the largest utility in the state with over 27,650 square miles of service territory and 3.8 million customers. FPC is the second largest utility with over 20,000 square miles and 1.37 million customers. FPL's 1999 revenues increased to \$6.1 billion, and Operations and Maintenance (O&M) expenses were \$3.389 billion. This equates to \$.56 of every dollar going to expenses. FPC's revenues were \$2.632 billion and its O&M expenses were \$1.565 billion. FPC spent \$.59 of every dollar for expenses.

Some areas of note include FPL's O&M expenses per customer which declined just over three percent from 1997 to 1999. Despite these changes, FPL's indicators reflected improvement over this period. The number of customers per employee which increased by over three percent over the period. FPC's O&M expenses per customer also declined over that same period by just over eight percent, while its number of customers per employee also increased by nearly five percent. Similarly, FPC's reliability indicators also exhibit improvement for the period.

1997-1999 General Statistics Comparison						
Utility	FPL 1997	FPL 1998	FPL 1999	FPC 1997	FPC 1998	FPC 1999
Operating Territory (square miles)	27,650	27,650	27,650	20,000	20,000	20,000
Generating Capacity (megawatt winter)	17,169	16,783	17,234	7,717	7,727	8,267
Distribution Substations	485	478	576	376	382	365
Substation Capacity (kva)	104,493,000	104,046,000	105,068,000	51,042,115	51,775,240	43,621,540
Customers	3,615,483	3,680,463	3,756,000	1,314,507	1,340,002	1,367,002
Total Employees	9,588	9,845	9,783	4,799	4,740	4,732
Union Employees	3,260	3,446	3,424	2,064	2,016	2,059
Operating Revenues (in \$1,000)	\$6,132,000	\$6,366,000	\$6,057,000	\$2,448,435	\$2,648,200	\$2,632,582
Residential Customer Revenues (in \$1,000)	\$3,393,388	\$3,579,602	\$3,357,244	\$1,293,654	\$1,391,767	\$1,394,869
Commercial Cust. Revenues (in \$1,000)	\$2,221,567	\$2,239,243	\$2,226,242	\$568,343	\$607,209	\$617,586
Industrial Customer Revenues (in \$1,000)	\$206,316	\$197,257	\$190,251	\$207,936	\$194,504	\$207,605
O & M Expenses (in \$1,000)	\$3,328,500	\$3,338,569	\$3,389,721	\$1,642,919	\$1,580,749	\$1,565,104
O&M Expenses Per Customer	\$921	\$907	\$892	\$1,250	\$1,180	\$1,145
Number of Customers Per Total Employees	377	374	388	274	283	289
Number of Customers Per Union Employee	1,109	1,068	1,110	637	665	664

EXHIBIT GEN-9

Source: 1997-99 Annual Report FERC Form 1, SEC 10-K, 10 Year Site Plan, and Statistics of the Florida Electric Utility Industry.

3.0 FLORIDA POWER & LIGHT COMPANY



3.0 Florida Power & Light Company

3.1 FPL Company Profile

As Florida's largest electric utility, Florida Power & Light Company (FPL) serves about one-half of the state's population. The operating utility is by far the largest subsidiary of the parent corporation, FPL Group. FPL Group also operates ESI Energy (domestic independent power projects), FPL Group International (global power projects), and Turner Foods Corporation (Florida citrus). FPL also owns and operates subsidiaries including FPL Energy Services, Inc., and FPL Energy Services II, Inc., which provide or market energy services, conservation services, or financing for these projects. Operating revenues for FPL totaled slightly over six billion dollars at year-end 1999, down from 1998's operating revenues of 6.3 billion dollars, and 6.1 billion in 1997. FPL employed a total workforce of 9,783 employees at the end of 1999, about 35 percent of whom are members of the International Brotherhood of Electrical Workers.

FPL's service territory covers an area of 27,650 square miles, covering the lower half of the Florida Peninsula, the entire Atlantic Coast except Duval County, and the Gulf Coast south of Tampa Bay. Providing reliable electric service to its large and stretched-out service area presents challenges that would not exist in a more compact, contiguous region. FPL serves outlying areas of extremely low density, such as the Everglades, as well as the high-density Miami/Fort Lauderdale area. Other cities served include St. Augustine, Daytona Beach, Melbourne, Stuart, West Palm Beach, Naples, Fort Myers, Sarasota, and Bradenton. In addition to its geographic diversity, FPL serves a culturally diverse customer base including large numbers of multi-ethnic customers, as well as concentrations of retired senior citizens and seasonal residents, resulting in unique customer service challenges.

Customer accounts totaled approximately 3.8 million through year-end December 1999, representing an increase of slightly over two percent from 1998, and 5.5 percent above 1997 levels. For the period spanning 1997 through year-end 1999, 1998 kWh sales increased 6.6 percent, then declined 2.1 percent for the six months ending June 30, 1999. In comparison, customer growth was 1.8 percent and 1.9 percent, respectively over these periods. This growth was fairly equally spread across the residential, commercial, and industrial customer categories.

Segmented by type, 88.7 percent were residential customers, accounting for just over one-half of 1999 energy sales. Commercial customers comprised 10.8 percent of the total, but they purchased 40.3 percent of FPL's total 1999 energy production. Industrial customers made up 0.004 percent of the customer base, which accounted for just over four percent of energy purchases.

Total FPL generating capacity stood at 16,444 megawatts at year-end 1999, of which 82 percent was fossil-fuel burning (largely oil and gas), and 18 percent was nuclear-powered. FPL's 34 base-load generating units include 28 steam turbines and 6 combined-cycle units. At year-end 1999, FPL owned and operated 576 distribution and 40 transmission substations with a total capacity

of 105.5 million kilovolt-amperes. FPL has just over 45,000 pole miles of overhead lines and over 21,000 miles of underground and submarine cable.

3.2 FPSC Service Quality Indicators

Since the issuance of the Bureau of Regulatory Review Staff's (staff's) 1997 electric service quality and reliability report, the key indicators of distribution service quality monitored by the FPSC continue to be customer complaints and complaints and the annual Distribution Service Reliability Report. While the components of customer complaints remain unchanged since the 1997 report, the elements constituting the annual service reliability reports have since been expanded and are discussed in more detail in Section 3.2.2 of this report. This section examines and compares FPL's continuing record in both areas over the period encompassing the 1997 staff report through year-end 1999.

3.2.1 FPSC Customer Complaints

FPL has experienced a marked decrease in the number of service-related customer complaints (such as those related to extended or momentary service interruptions and voltage problems) since the issuance of staff's 1997 report. As depicted in **Exhibit FPL-1**, FPSC logged service complaints have fallen from a 1996 high of 897 to 257 in 1998. This drop in service-related customer complaints to the Commission reverses the previous steadily increasing trend that began in 1992. However, as the graph indicates, logged complaints rose in 1999 by 25.3 percent over the 1998 low of 257 to 322. This increase in 1999 logged service complaints appeared to be focused during the latter half of the year and was possibly due to change in FPSC complaint logging procedures. Beginning in July 1999 through the end of the year, complaints to the Commission averaged 41.5 per month, whereas for the first six months of the year, complaints averaged only about 12 monthly.

From 1992 through 1997, increased customer expectations combined with the effects of deteriorating service quality and reliability resulted in the upward trend in customer service-related complaints to the Commission. Conversely, FPL's efforts in customer awareness and education combined with the effects of aggressive efforts in the area of preventive maintenance and repair

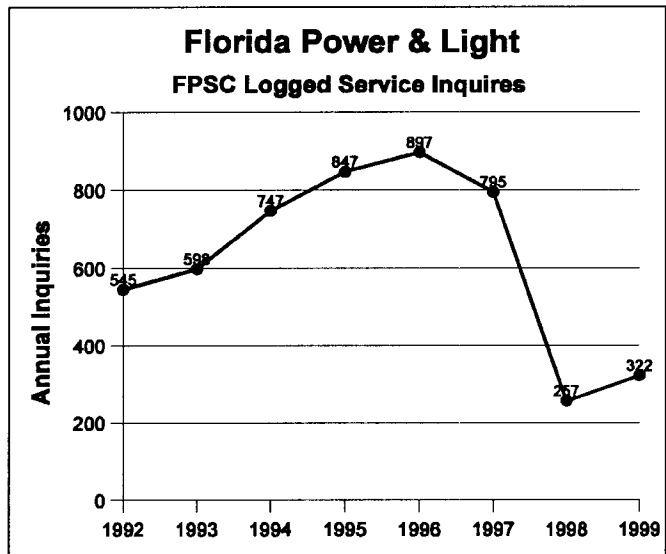


EXHIBIT FPL-1

Source: FPSC Consumer Activity Reports 1992--1999.

Note: Logged Service Complaints were projected at 853 in the 1997 report.

have contributed greatly in a significant reduction in service-related complaints in the two years since the 1997 report was issued.

3.2.2 FPSC Distribution Service Reliability Report

As a result of the Bureau of Regulatory Review staff's 1997 report, reporting requirements have been modified on an experimental basis over a three-year period expiring in 2001. The trial modifications—agreed to by the state's four investor owned utilities—require the reporting of industry standard reliability indices commonly referred to as CAIDI, SAIDI, SAIFI, and MAFIE. These indices will be provided to the FPSC in addition to N, L-Bar, and 3 percent worst-performing feeders during the trial period.

As stated in staff's 1997 service quality and reliability report, results from FPL's annual Distribution Service Reliability Report for the period of 1992 through 1996 indicated substantial declines in all three areas measured at that time. The reliability reports filed for 1997 through 1999 indicated what may be the beginning of a downward trend in the total number of annual interruptions (N). Although N peaked for the study period in 1997 at 96,529 interruptions, 1998 interruptions were down 6.7 percent at 90,060, as shown in **Exhibit FPL-2**. FPL's 1999 annual reliability report filed with the Commission indicated 86,647 year-end total interruptions—or a decrease of 10 percent from the 1997 peak and about four percent lower than 1998. One area of note in **Exhibit FPL-2** is the number of interruptions due to transformers. This number is being reported by FPL as zero for 1999, although it was originally projected at 283. FPL decided to allocate this number to other interruption categories to be more accurate under the theory that transformer interruptions are a symptom of another cause (such as lightning).

Exhibit FPL-3 graphically depicts data from exhibit FPL-2 for the most frequent causes of interruptions experienced in the years 1992 through 1999. In each year, the top five causes were: unknown (repairman was unable to detect a specific cause), lightning, other (other than one of the reporting categories specified by Rule 25-6.0455), tree-related, and animal. The fact that the leading cause was "unknown" underscores the transient nature of most interruptions and the difficulty and uncertainty inherent in reconstructing a cause after the fact. FPL believes, however, that a significant portion of the "unknown cause" interruptions are tree-related. Frequently, the direct cause for an interruption may not be exactly discernable to the crewman recording the incident. In such cases, an interruption may be recorded as tree-related when, in fact, the cause is something else. The result would be an artificially inflated figure for tree and vine-related interruptions. As the exhibits show, FPL has made progress in lowering its number of interruptions categories as "unknown" since 1997.

**Florida Power & Light
Total Interruptions by Category
1992-1999**

Cause	1992		1993		1994		1995		1996		1997		1998		1999	
	Total	%	Total	%	Total	%	Total	%	Total	%	Total	%	Total	%	Total	%
Animal	6,321	9	6,575	9	6,558	8	7,439	9	7,401	8	9,093	10	7,869	11	9,661	11
Corrosion	1,706	2	1,960	3	2,508	3	1,881	2	1,357	2	1,289	1	1,326	1	1,593	2
Dig-In	915	1	1,037	1	933	0	824	1	796	0	742	0	774	0	986	1
Lightning/other weather	10,245	15	13,568	18	14,491	18	10,287	12	11,008	12	15,389	16	13,011	14	13,005	15
Salt Spray	203	0	250	0	347	0	343	0	496	1	412	0	406	0	537	1
Substation	190	0	193	0	183	0	197	0	223	0	234	0	199	0	0*	NA
Transformer	866	1	602	1	213	0	849	1	231	0	172	0	346	0	0	0
Tree/vegetation	9,649	14	7,550	10	9,428	11	10,553	13	11,347	13	12,086	13	12,169	14	12,303	14
Unknown	29,584	42	32,706	44	37,335	46	42,119	50	46,341	52	46,345	48	39,398	44	30,518	35
Vehicle	1,089	2	1,198	2	1,190	1	1,192	2	1,073	1	1,077	2	1,108	1	1,228	1
Other	9,516	14	8,913	12	8,840	11	8,218	10	9,686	11	9,690	10	13,454	15	16,816	20
Total	70,284	100	74,552	100	82,026	100	83,902	100	89,959	100	96,529	100	90,060	100	86,647	100

EXHIBIT FPL-2

Source: FPSC Reliability Reports 1992-1999.

* Substations are excluded from Distribution Reliability beginning in 1999.

As with N, FPL's average length of interruptions (L-Bar) results from 1997 through 1999 also show the beginnings of reversing its increasing trend. During the period 1992 through 1996, FPL's L-Bar grew by 33 percent. For 1996 and 1997, L-Bar was constant at 165 minutes before decreasing in 1998 to 152—down 8 percent from the 1996-97 plateau. Results for 1999 showed a continuing decrease with an L-Bar of 144. These results equate to an annual decrease in duration of interruptions of about eight percent between 1997 and 1998 and slightly over five percent between 1998 and 1999. The trend in L-bar for the study period can be tracked in **Exhibit FPL-4**.

Florida Power & Light Frequent Interruption Causes

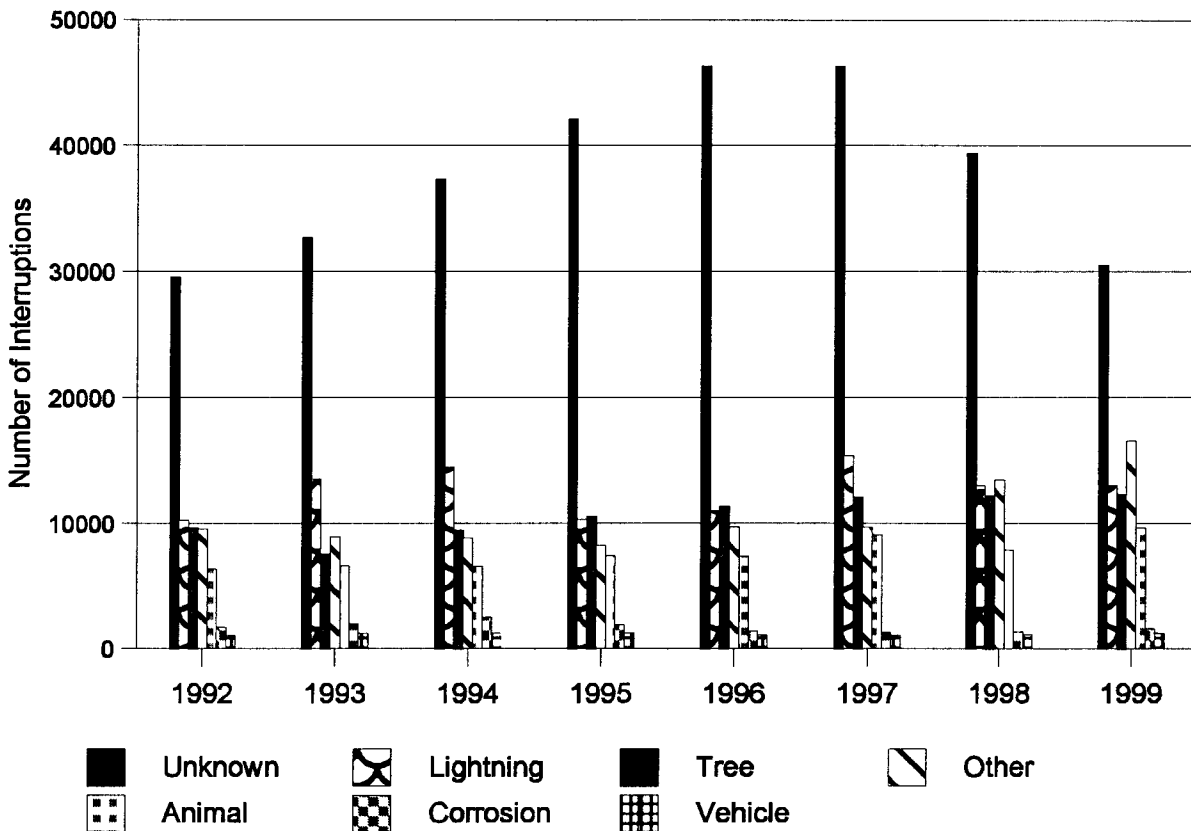


EXHIBIT FPL-3

Source: FPSC Reliability Reports 1992-1999.

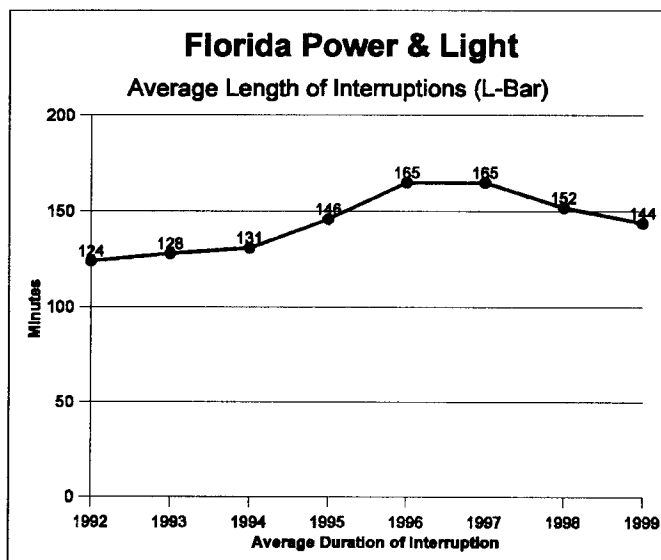


EXHIBIT FPL-4 *Source: FPSC Distribution Reliability Reports 1992--1999*

The FPSC Distribution Service Reliability report continues to require utilities to identify distribution feeder lines with the highest numbers of interruptions. As reported in 1997, FPL's three percent "worst-performing feeder" lists showed patterns of feeders repeatedly making the list over the period covered. These "repeat offenders" represented identified trouble areas being experienced for multiple years without being fully resolved, resulting in the area of poor-performing feeders becoming a major area of focus by FPL beginning in 1997. This subject area is more fully discussed in section 3.5 of this report.

3.3 Company Service Quality Indicators

While the FPSC measures of customer inquiry activity and the Distribution Service Reliability Reports provide indicators of service quality, FPL uses additional methods of monitoring performance, including their service unavailability index (SAIFI), CAIDI, SAIFI, complaints, and customer satisfaction surveys. These indices help the company identify trends and areas in need of improvement.

3.3.1 Internal Service Quality Indicators

In 1997, FPL's internally-tracked service quality indicators denoted a substantial decline in distribution service reliability over the six-year period under review. Since then, the company has shown marked improvement in each of the indicators analyzed. The following paragraphs discuss the turn around in trends. Although company-wide results are discussed below, many of these indicators are also calculated and examined internally by FPL for smaller service areas.

Service Unavailability

The primary indicator of overall system distribution service quality tracked by FPL remains the service unavailability index. The service unavailability index indicates the system-wide annual number of minutes of service interruption experienced by the average customer served by FPL. Service unavailability is equivalent to System Average Interruption Duration Index (SAIDI) discussed in Section 2.2.1 of the report, which is widely used throughout the electric industry. Although it is similar in some ways to the FPSC Reliability Report's "L-Bar" indicator of average interruption duration, service unavailability also reflects the impact of the vast majority of customers who actually experience zero or very few minutes of interruptions. Therefore, service unavailability (SAIDI) provides an overall, weighted-average picture of total system interruption time, while L-Bar

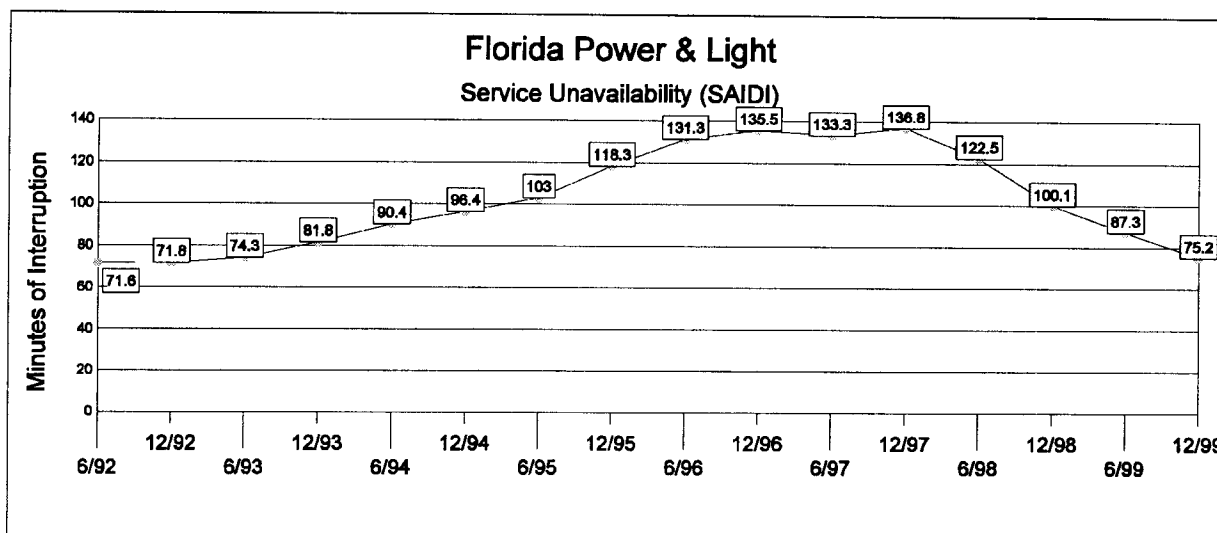


EXHIBIT FPL-5

Source: FPL Response to Document Request 1-12.

shows the average length of all interruptions without regard for the number of customers affected. **Exhibit FPL-5** graphically displays service unavailability data for FPL for the entire period under review (June 1992 through June 1999). During the five-year test period covered in staff's 1997 report, the average FPL-served customer experienced a nearly 100 percent increase in total annual interruption time as measured by service unavailability. An analysis of individual service unavailability results for FPL's 15 geographical service areas indicated that this increase was widespread throughout FPL's service territory and not isolated to just a few areas.

Beginning in 1998, the duration of interruptions experienced by customers began a steady decline as a result of actions taken by the company. FPL states it expects the downward trend in SAIDI to continue as it reaps continued benefits from its improvement programs. Year-end 1999 SAIDI was 75.2 minutes. For year-end 2000, FPL has set its SAIDI goal at 86.3.

Exhibits FPL-6 and FPL-7 separately display the two components of service unavailability: average interruption duration and frequency of interruptions. As described in section 2.1.1, the duration component is frequently referred to as Customer Average Interruption Duration Index (CAIDI). This measure shows the average length of an interruption for the customers who

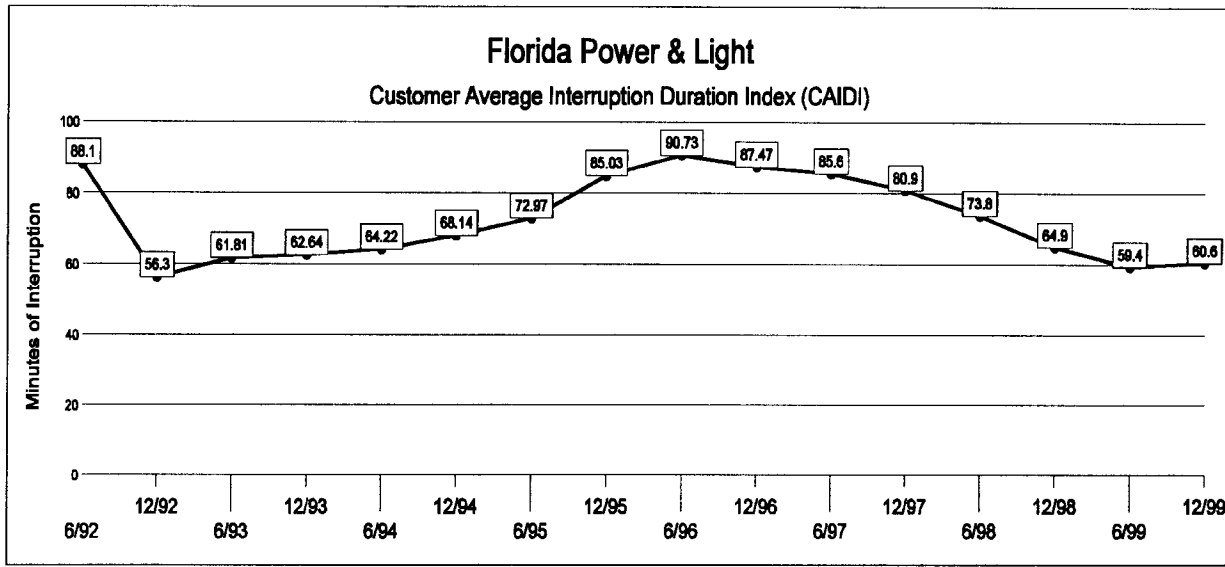


EXHIBIT FPL-6

Source: FPL Response to Document Request 1-12.

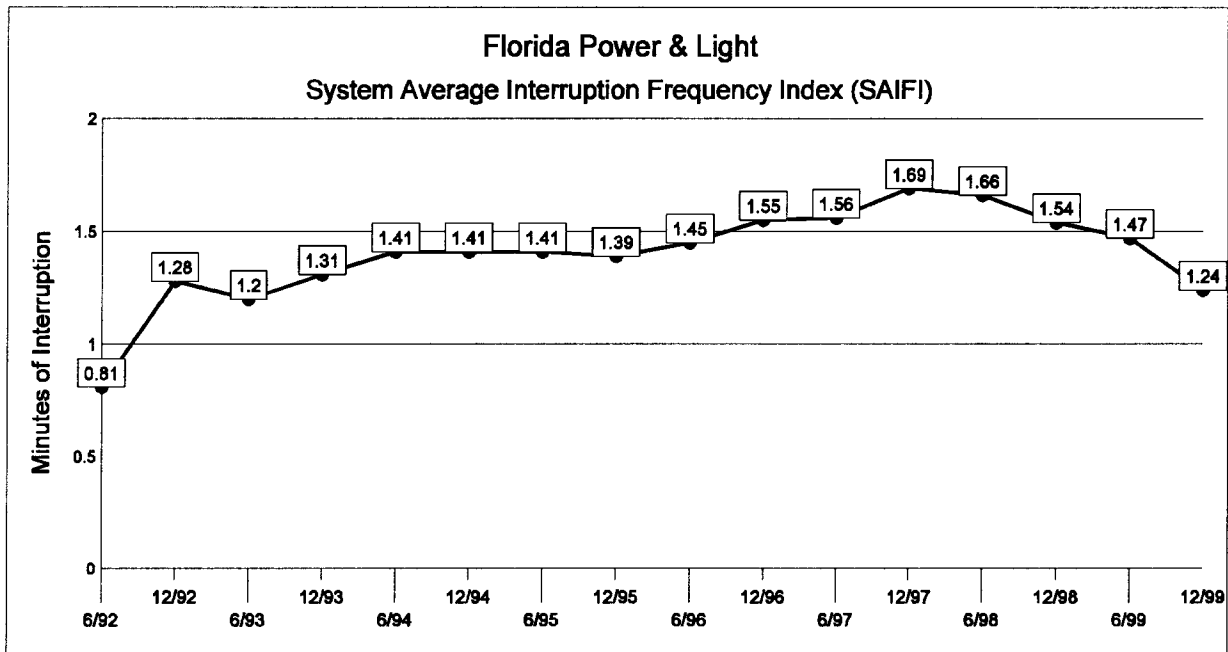


EXHIBIT FPL-7

Source: FPL Response to Document Request 1-12.

experienced an interruption. As reported in 1997 and shown on Exhibit FPL-6, FPL's outage duration dropped dramatically in late 1992 from 88.1 to 56.3 minutes, then increased steadily through mid-1996 reaching a high of 90.73 minutes. It should be noted that the 1992 results reflected a significant exclusion due to Hurricane Andrew. FPL began a reversal in interruption duration after June 1996, reducing CAIDI in 1997 and 1998. As Exhibit FPL-6 indicates, CAIDI

leveled out in 1998 and 1999 to about 60 minutes. At year-end 1999, FPL's CAIDI of 60.6 stood near the company's low for the period under review (56.3 in June 1992). For year-end 2000, the company has established a goal of 64.9 for CAIDI.

The second component of service unavailability is referred to as the system average interruption frequency index or SAIFI. Also defined in section 2.1.1, SAIFI is a measure of the average number of times all customers on the system experience an interruption. As Exhibit FPL-7 indicates, SAIFI increased sharply during the last six months of 1992, then remained relatively stable through year-end 1995. Beginning in 1996, interruption frequency increased to its highest point at year-end 1997 at 1.69 interruptions. As the graph illustrates, since year-end 1997 FPL has experienced a steady SAIFI decrease in each of the six-month reporting periods through year-end 1999. FPL's SAIFI goal for year 2000 has been set at 1.33.

3.3.2 Utility-Handled Inquiries and Complaints

Customer inquiries to FPL continue to be received through the company's customer service department's phone centers. Inquiries received may involve customers calling with a question, a request, a problem, or a complaint. They may range in subject area from account balance information to a request for new service connection or a complaint about frequent momentary interruptions.

As shown in Exhibit FPL-8, incoming calls of all types began to decline in number starting in 1997 before leveling out in 1998 and 1999 at about 10.8 million customer inquiries per year. This is still well above the 1993 levels of inquiries prior to a sharp increase in 1994.

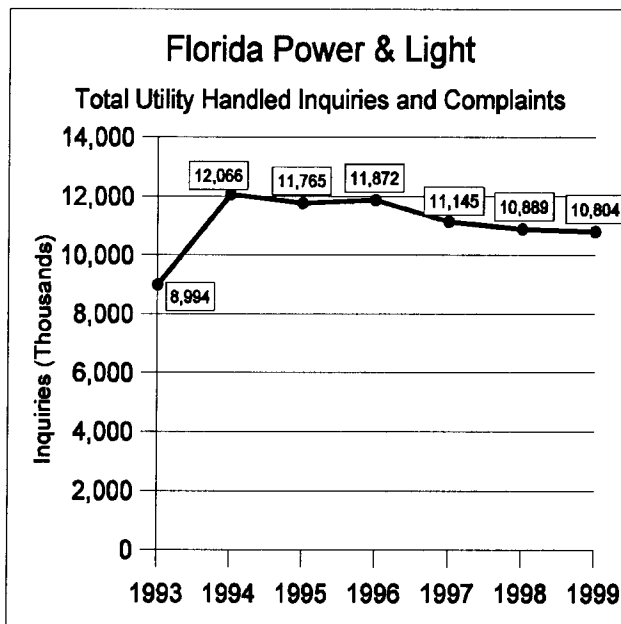


EXHIBIT FPL-8 Source: FPL Response to DR 1-48, 2-1, & 5-1.

Over this period, incoming inquiries relating to trouble reports or outages increased sharply from 1993 to a peak of 1.27 million in 1996, as shown in Exhibit FPL-9. In 1997, annual trouble and outage service inquiries declined from the previous peak to near a reporting period low of 752,000 in 1998. However, these numbers rebounded in 1999 to 985,000 service inquiries, representing an increase of 31 percent over 1998 amounts and 78 percent over the 554,000 inquiries projected for the period by FPL. During 1998, FPL's territory was affected by Hurricane's Floyd and Irene which may account for some of the increase.

Customer complaints that require escalation within FPL for handling are referred to as "executive complaints." These are usually instances where a dissatisfied

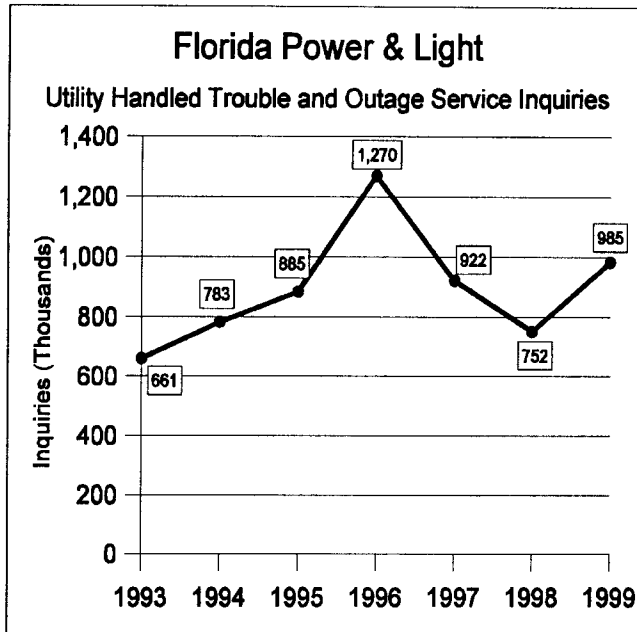


EXHIBIT FPL-9 *Source: FPL Response to Document Request 1-48, 2-1, & 5-1.*

customer has asked to speak with a manager or has specifically addressed letters to company officers. The company response, through the appropriate FPL representative, is handled much like the resolution of FPSC complaints and is tracked for record-keeping purposes.

During 1997, FPL began to categorize executive complaints to provide future ability to analyze trends in types. Staff's 1997 report indicated FPL received 640 complaints for the nine months ending September 30, 1997. At actual year-end 1997, executive complaints totaled 729. The following year, executive complaints fell slightly more than 15 percent to 618 for 1998. However, the decline in executive complaints seen in 1998 was short lived. For 1999 as a whole, executive complaints increased by 335 (54 percent) over 1998, totaling 953 for the year.

As described in staff's 1997 reliability report, FPL consolidated the handling of distribution-related complaints within the Distribution Business Unit during 1995 in an effort to make handling of such complaints more effective and efficient. This change made complaint resolution an operational function, as opposed to a staff function. In 1997, the Distribution Business Unit further expanded the complaint-handling function to include customer interface activities for determining customer relations needs specific to distribution activities, as further described in section 3.5.

FPL states that since the customer complaint process has been moved to an operational function within the Distribution Business Unit, responses to the FPSC and to customers have been handled more consistently and in a more timely manner. The new organization also aids in the analysis of trends in customer complaints, allowing the company to identify opportunities for improvement. Substantial amounts of administrative work are required to document the complaint resolution process. With the new organization, staff personnel are used to perform this work, which allows field personnel to focus their time and expertise on field-related issues.

3.3.3 Customer Satisfaction Surveys

FPL continues to use customer survey information to monitor customers' perceptions of service quality and to identify changes in customer satisfaction. FPL has used the same contractor to perform its basic customer satisfaction surveys from 1992 to date, which provides continuity in methodology and interpretation. Although FPL has requisitioned special-purpose surveys from third-party vendors in the past, none have been commissioned since the Commission's 1997

reliability report was issued. One survey by JD Powers and Associates was purchased in 1998 for company use.

As reported in 1997, FPL management utilizes these various surveys, in conjunction with internal indicators such as those described in Sections 3.3.1 and 3.3.2, to identify areas in need of improvement. For example, in selecting the internal indicators used to track customer service discussed in section 3.3.1, the dividing lines used to denote acceptable and unacceptable interruption length and duration are provided by FPL customers themselves through their satisfaction surveys.

Residential Customers

Survey results provided by FPL indicate a marked increase in customer satisfaction from 1997 through year-end 1999. Residential customer satisfaction with continuous uninterrupted power increased from 61 percent for both 1997 and 1998 to 69.5 percent in 1999. Surveys indicated customers' perceptions of power quality also improved in 1999, increasing to 57.5 percent from 1997 and 1998 levels of about 55 percent. The levels of residential customer satisfaction with service restoration (duration of outage) increased between 1997 and 1998 from 55.3 percent to 58.9 percent. (Results for 1999 were not available.)

Commercial/Industrial Customers

FPL reports large commercial and industrial customers' perceptions of power quality have significantly increased for year-end 1999. In aggregate, these customer types indicated satisfaction in power quality at about 50 percent in both 1997 and 1998, increasing in 1999 to a 61 percent satisfaction level.

The perception of commercial/industrial customers regarding restoration times has remained relatively constant, though lower than that for residential customers. In 1996, 58.4 percent of commercial/industrial customers said they were satisfied with service restoration times, compared to 58.3 percent in 1997, and 57 percent in at mid-year 1998. (Results for 1999 were not available.)

3.4 Distribution Organization and Service Quality Activities

The delivery of power to end-use customers is the responsibility of FPL's Distribution Business Unit. Therefore, this organization plays the major role in electric service quality since it is responsible for both the maintenance and repair of the portion of FPL's system that actually brings power to customers.

3.4.1 Structure, Staffing, and Functions

Spurred by its overall deterioration in distribution service quality indicators, FPL made extensive changes in its Distribution Business Unit leadership beginning in early 1997 with the naming of a new vice-president. FPL's new Energy Distribution Organization is depicted in **Exhibit FPL-10**

FLORIDA POWER AND LIGHT ENERGY DISTRIBUTION JUNE 1999 ORGANIZATIONAL CHART

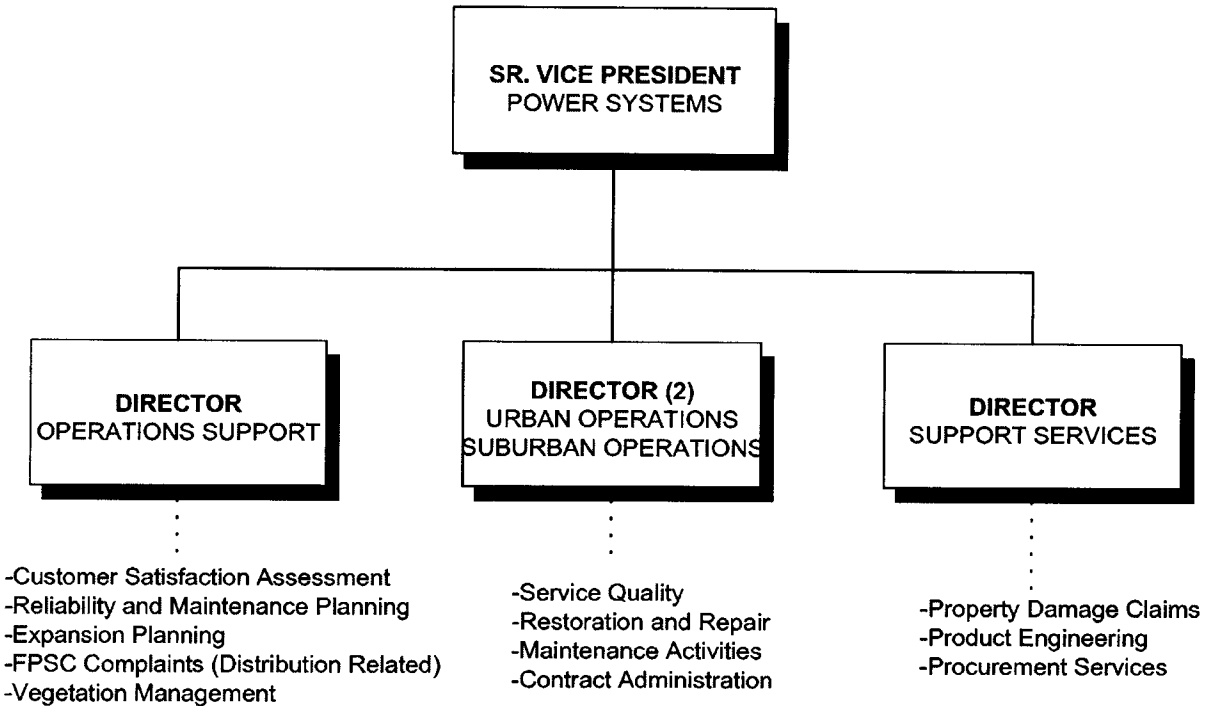


EXHIBIT FPL-10

Source: FPL Response to Document Request 2-8.

3.4.2 Maintenance Planning

Planning for the maintenance of the company's existing distribution system and its future expansion is a key component for providing an adequate distribution infrastructure. To this end, FPL has implemented several changes that affect the overall strategy of maintenance planning.

As the result of the organizational changes described in section 3.4.1, the Distribution Business Unit's new Director of Operations Support is now responsible for ensuring FPL's distribution infrastructure can adequately serve the customer load. This responsibility is administered by developing and implementing FPL's overall reliability and maintenance plan, known as Reliability 2000 (discussed in Section 3.5.4.)

According to FPL, Operations Support staff under the Reliability Manager has taken on process responsibility to provide and maintain a reliable electric distribution system. This group is responsible for maintaining FPL's distribution system reliability through development of Reliability 2000 and supporting the line organization in implementation of the plan. FPL states that a key

component of this process involves planning for the upkeep and expansion of the distribution infrastructure. In planning for system reliability, the Reliability Support staff make use of internal reliability data, along with customer satisfaction survey results in prioritizing both capital and operations and maintenance expenditures.

An analysis of distribution O&M expenses over the study period may cast more light on the priority given maintenance over time and how that priority is changing. As **Exhibit FPL-12** points out, FPL's distribution O&M spending reached its all-time low for the study period in 1996 after a steady decline that began in 1993. However, during 1997 FPL began to reverse the trend in Distribution O&M spending, posting an 11.5 percent increase in 1997 over the previous year. During 1998, these expenses increased another 33 percent. For 1999, distribution O&M expenses declined \$10.9 million, or a little over four percent from 1998 to \$238.8 million, as illustrated in Exhibit FPL-12. Though declining from the previous year, 1999 Distribution O&M expense remained substantially above 1996 levels.

Whereas cost reductions appeared to have been detrimental to service quality as measured in the 1997 reliability report, the subsequent increases in Distribution O&M appear to have been beneficial to service quality. For comparison, O&M spending for the company as a whole (both with fuel and excluding fuel) is presented in **Exhibit FPL-11**.

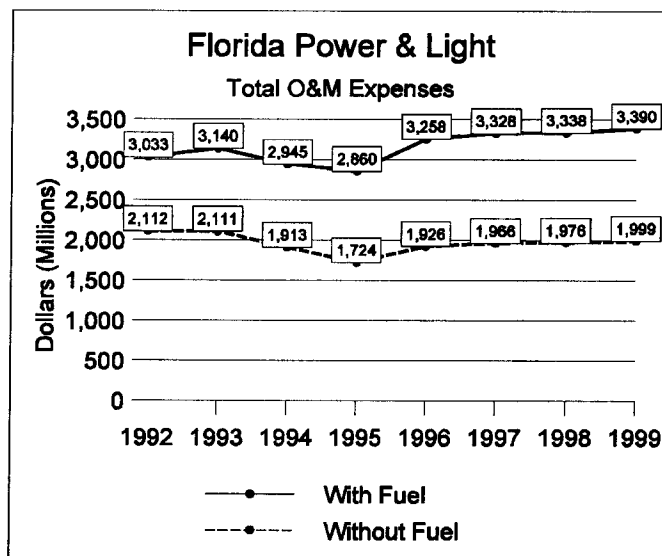


EXHIBIT FPL-11

Source: FPL FERC Form 1, 1992-1997, DR 2-10, 1998-99.

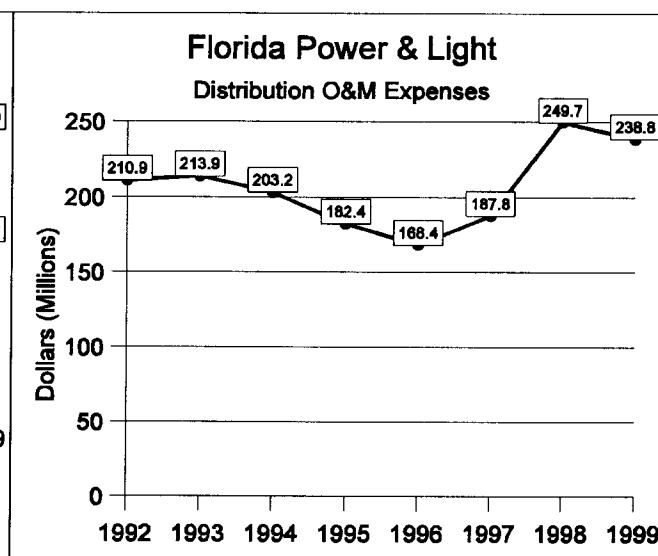


EXHIBIT FPL-12

Source: FPL FERC Form 1, 1992-1997, DR 2-10, 1998-99.

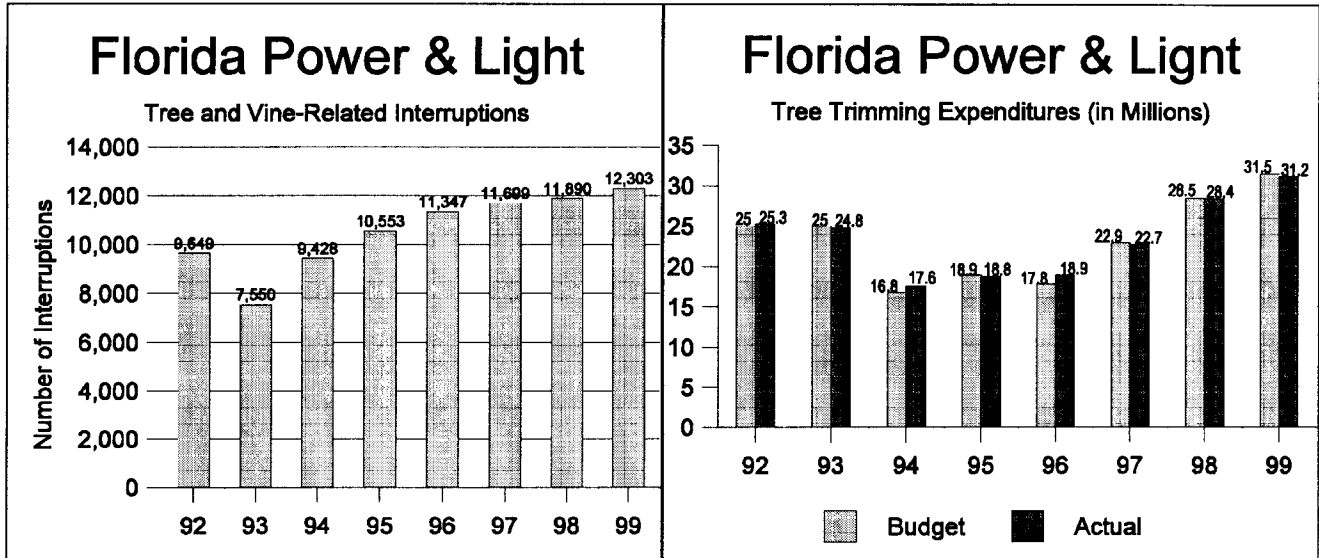


EXHIBIT FPL-13 Source: FPL response to DR 1-44, 2-1, and Annual Distribution Reliability Reports.

EXHIBIT FPL-14 Source: FPL Response to DR 1-22, 2-1 and 5-5.

3.4.3 Tree Trimming

Tree trimming (line clearing) continues to be a key area of focus for FPL. Exhibits FPL-13 and FPL-14 depict tree and vine-related outages, while Exhibits FPL-14 and 15 illustrate tree-trimming budgets and expenditures for the entire period under review. As shown in Exhibit FPL-13, the number of tree-related interruptions continued to increase from 1993 through 1999.

At year-end 1999, actual tree and vine related interruptions stood at their highest level for the eight-year study period at 12,303. This represents an increase of just over one percent over the past year, and a 1.8 percent increase over 1997 tree and vine-related interruptions of 12,086. During interviews, FPL personnel stated one reason for the continued rise in tree and vine-related interruptions may be due, in part, to restoration crews recording some “Unknown” causes as tree related. The problem of classifying “Unknowns” is described more fully in section 3.2.2.

Following FPL’s acknowledgment of falling behind in the area of tree trimming in 1997, the company made efforts to address the problem through increases in tree trimming expenditures. For 1998, budgeted amounts for tree trimming increased \$5.6 million from 1997 or 24 percent. The actual 1999 year-end total for the category is \$31.2 million, an increase of just over 9.8 percent beyond 1997 expenditures of \$28.4 million. These increases in expenditures over 1997 levels are largely due to increased miles of lines treated and new programs to identify and treat problem areas. FPL has implemented a “variable maintenance cycle” that takes into account areas that may require more or less frequent attention than specified by the company’s three-year treatment cycle.

Florida Power & Light Cost of Line Trimmed 1997 through 1999				
Year	Planned Miles	Budgeted Dollars (000's)	Actual Miles	Actual Dollars (000's)
1997	NA*	\$22.9	5,349	\$22.7
1998	7,000	\$28.5	7,540	\$28.4
1999	8,377	\$31.5	3,544 (6/99)	\$31.2 (6/99)

EXHIBIT FPL-15

Source: Document Request No. 1-1, 5-5

**Prior to 1998, planned miles were not tracked.*

Tree trimming under the variable cycle is prioritized based on most current performance information and time of last maintenance, and cycles are scheduled by electric circuits. Although FPL increased its budget for tree trimming by one million dollars in the year 2000, FPL believes this funding level will allow it to regain control of vegetation growth affecting its facilities.

In comparison, funding for FPL’s tree-trimming operations was increased by \$6.4 million during 1997, which was 21 percent above 1996 actual expenditures. According to FPL, the additional funding in 1997 was used to support the now disbanded “worst feeder” tactical teams (discussed in section 3.5.1) and resulted in a 12 percent increase in the number of feeder miles trimmed during 1997 beyond that year’s original plan.

Despite these efforts, the number of tree and vine-related interruptions still increased from 12,086 in 1997 to 12,303 in 1999. Although FPL increased its tree-trimming expenditures beginning in 1997 with notable increases in 1998 and 1999, the hoped-for decreases in tree and vine-related interruptions, which were anticipated to be seen beginning in 1998, have not yet occurred.

As mentioned earlier in section 3.4.1, FPL’s tree-trimming operations have been relocated from Distribution Support Services to Distribution Operations Support under the direction of the Vegetation Management Manager. As before, the manager is responsible for oversight and evaluation of all line-clearing activities, which include tree trimming, tree removal, and vine control. Presently, the manager has three supervisors, with ten utility arborists under their direction, whose primary responsibilities include administration of contracts, evaluation of contractor work completed reports, and field evaluation of contractor performance.

All of FPL’s line-clearing activities continue to be performed by outside contractors who abide by the procedures outlined in the Certified Arborist Manual published by the International Society of Arboriculture (ISA). Presently, the company contracts tree-trimming services through Asplundh, which performs one hundred percent of the company’s line clearing operations. As

reported in 1997, Asplundh is paid on the basis of the amount of brush, branches, and vines removed. Verification of the work completed is provided through weekly unannounced field audits by FPL arborists. In addition to verifying reported amounts cut, the inspections address quality of work, compliance with cutting guidelines, customer contact efforts, quality of supervision, and quality of documentation.

FPL continues to conduct customer education efforts in the area of tree trimming as described in the 1997 report. Customer educational efforts continue to be focused on including articles in *Energy News*, FPL's monthly customer billing insert. FPL also states it participated in local Arbor Day, Earth Day, and other fairs and celebrations with educational displays and handouts. The company continues to urge customers to report trees growing into distribution wires and to avoid trimming near wires. FPL continues its focus upon making customers aware of the possibility of trees and shrubs eventually interfering with lines before planting by placing the "right tree" in the "right place."

3.4.4 Substation Maintenance

As a vital component of the distribution system, the proper maintenance of substations is key to overall system reliability. Even the temporary loss of a substation can affect thousands of customers and require rerouting of portions of the system load.

Over the period of 1992 through projected year-end 1997, the number of total distribution substation outages remained relatively stable, as shown in **Exhibit FPL-16**. The lowest levels of total distribution sub-station outages over the entire period occurred in 1998 and 1999 with 204 and 245 total outages respectively. An average of 266 interruptions per year occurred over the eight-year period ending 1999. Since 1997, breaker operations have declined to an all-time low for the reporting period of 81 in both 1998 and 1999.

Exhibit FPL-16 also lists two new categories introduced in 1999 for itemizing substation outages: Process Execution and Communications. *Process Execution* is a category inherited from the Protection and Control Department when it was merged with the Substation Department. This category is used to track outages that occur because a work process was not followed correctly. *Communications* refers to outages caused by telemetry equipment used to monitor and control substation operations (such as SCADA and power line carrier equipment). In addition, FPL has chosen to allocate the balance previously reported as *Other Substation Equipment* between the *Breaker* and *Transformer* outage categories to be more accurate.

As described in staff's 1997 report, maintenance of FPL's distribution substations remains the responsibility of the Substation Department of the Power Delivery Business Unit, which also maintains FPL's transmission substations. A complete reorganization of this business unit, including significant manpower reductions, was carried out in 1994. Total bargaining unit employees decreased from 412 in 1993 to 363 in 1994. At year-end 1997, the number of employees stood at 252 (although the 1997 plan called for 210). Although 202 bargaining unit employees were planned for both 1998 and 1999, actual levels were 294 and 295, respectively.

Florida Power & Light Total Substation Outages by Category 1992 through 1999									
CAUSE	1992	1993	1994	1995	1996	1997	1998	1999	
Breaker	99	113	103	114	102	131	81	81	
Regulators	64	77	63	68	63	82	53	35	
Animal	43	45	22	27	26	43	24	76	
Other Substation Equipment	38	25	29	32	26	16	15		
Human Element	12	12	10	15	7	8	5	3	
Transformer	5	11	6	12	10	8	3	25	
Unknown	5	10	2	2	3	2	9	2	
Foreign Interference	4	0	4	1	4	8	5	0	
System Related	3	0	2	3	0	3	1	0	
Process Execution									13
Environment	1	10	8	6	26	7	8	5	
Communications									5
TOTAL	274	303	249	280	267	308	204	245	

EXHIBIT FPL-16

Source: FPL Response to Document Request 1-42,6-6,& 5-6.

Exhibit FPL-17 displays total planned distribution substation maintenance expenditures for the eight-year period under review (1992 through projected 1999). As the graph illustrates, planned maintenance costs have remained within an approximate one million dollar range annually from 1994 through projected 1999. The last two years of this review saw the greatest fluctuation within this six-year window. Expenditures decreased nearly 14 percent from 1997 to 1998, then increased over 22 percent from 1998 through 1999. Because of reorganization in 1999, actual expenses shown for the year include amounts for the Protection and Control group, in addition to those of the Substation group. In comparison, 1992 and 1993 (though decreasing nearly 24 percent between the two years), experienced substantially higher planned substation maintenance costs than the most recent six years.

Maintenance activities, including inspections of each distribution substation every other month, are coordinated within each of five geographical service areas. These inspections continue to be performed by electrician specialists, covering specified checkpoints including: station

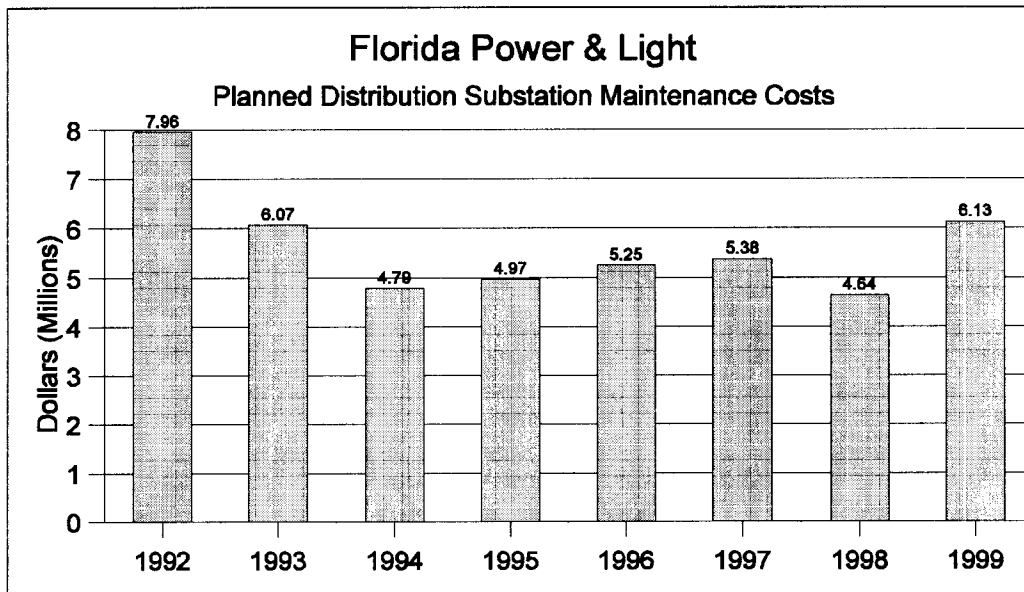


EXHIBIT FPL-17

Source: FPL Response to Document Request 1-20, and 5-7.

perimeter security, station grounding, bushing connections, battery condition, and counter readings. Exceptions observed are recorded via a pen-based tablet computer system, which has been in use since 1994.

3.4.5 Plant and Equipment Inspection

The methods used to inspect plant and equipment remain substantially the same as reported in 1997. Aging or defective plant and equipment in need of replacement are identified by FPL through the course of normal repair and maintenance activities and through investigating reported problems. Distribution Operations also has the capability to identify possible trouble areas and trends through input received from internal sources. These include its analysis of Early Warning Reports, customer complaints, and Distribution Support Services' analysis of customer property damage claims (see FPSC's July 1999 report, *Electric Customers' Property Damage Claims*).

In addition, the maintenance planning process identifies and prioritizes major projects involving plant refurbishment and replacement. The *Reliability 2000 Plan* includes initiatives to review conductor replacement and system design standards and to assess distribution components such as transformers, cable, and lightning/grounding protection over the period 1998 through 2000.

Wood Pole Inspection and Treatment

According to FPL, pole-caused interruptions continue to be only a minor problem. Over the eight-year period ending in 1999, pole-caused interruptions accounted for just 412 interruptions or less than one percent of FPL's total. From approximately 1984 through 1994, FPL utilized an outside contractor to perform inspection and treatment of creosote wood poles. All poles were injected with a fumigant to prevent termite and other pest infestation. After concluding that second treatments of

creosote poles did not significantly impact the service life, FPL discontinued the program. Since the end of the creosote pole treatment program, FPL's maintenance practices specify "all deteriorated poles identified via normal work should be evaluated for reinforcement and if not applicable then replaced. Pull poles initiated by customer request/complaints." For 1999, FPL's Reliability 2000 budget allowed for 17,670 poles to be inspected at a total planned cost of \$500,000 with the notation that rejected poles would be braced, and no replacements would be made until the year 2000. The actual number of poles inspected in 1999 exceeded projections by 9,023, with a corresponding budget overrun of only \$4,374. **Exhibit FPL-18** provides an analyses of actual creosote pole inspection and treatment activities for 1995 through 1999.

Florida Power & Light Pole Inspection and Treatment 1995 through 1999 Actual					
	1995	1996	1997	1998	1999
Number of inspections & treatments	Not Planned	Not Planned	Not Available	2600	26,693
Poles Rejected	906	1,042	Not Available	212	1,009
Poles Braced	0	0	Not Available	412	928
Total Cost	\$2,136,169	\$1,821,835	Not Available	\$267,100	\$504,374

EXHIBIT FPL-18

Source: 1997 report, DR 1-1, 1-27, 3-5, and 5-8

Note: FPL states that the company did not have the ability to capture the data in 1997 as in the previous years. For 1995 and 1996, FPL states a Purchase Order was in place that captured pole-related work. In 1997, the Purchase Order was not available and any inspections, rejections, or bracings were done through the local level.

Cable Injection and Replacement

Due to the nature of the asset, underground cable is both difficult to locate, repair, or replace. Since the 1997 report was issued, FPL has changed its policies and practices regarding how many failures a cable may experience before replacement is required. FPL states its current practice is to assess the situation with the first failure (as opposed to the previous policy of waiting until the second failure) of a section of underground cable. Field information is gathered to determine what course of action is best for the rehabilitation of the cable. Rehabilitation of the cable can be

accomplished by silicone injection, by replacement of the cable (pulling new cable through the existing conduit, or by directional boring if the cable was direct-buried).

During the eight-year period ending in 1999, FPL has replaced over 88 million feet of distribution wire and cable. As shown in **Exhibit FPL-19**, the replacement of deteriorated cable and wire increased in 1998 and 1999 over averages for 1994 through 1997. Amounts for 1993 are not comparable to other years because damages from Hurricane Andrew caused replacement of large amounts of overhead wire. The *Reliability 2000 Plan* discussed in section 3.5.4 addresses cable performance assessment and plans for replacement during 2000.

Florida Power & Light Cable and Wire Removed From Service (Combined Overhead and Underground) 1992-1999								
	1992	1993*	1994	1995	1996	1997	1998	1999
Feet of Wire and Cable Removed (000 ft)	10,684	28,899	8,477	7,348	6,598	7,435	9,358	9,280
Annual Total Retired Cost (\$000)	\$11,400	\$17,980	\$8,769	\$8,736	\$8,540	\$10,548	\$13,118	\$20,475

EXHIBIT FPL-19

Source: FPL Responses to Document Request 1-29, 5-9

*Included amounts attributable to Hurricane Andrew.

Transformer Replacement

Faulty transformers are another element in the distribution system that effect service quality and reliability. Through the course of performing repairs or reassessing load additions, FPL Distribution Operations identifies the need for replacement of transformers on an ongoing basis. Replacement can be triggered by lightning damage or simply the addition of load over time resulting from new construction (referred to as load creep) that eventually exceeds the unit's rating. The *Reliability 2000 Plan* also addresses assessment of distribution components, such as transformers, and future replacement and maintenance expenditures.

As shown in **Exhibit FPL-20**, the number of transformer replacements of all types, for both preventive and corrective purposes, increased significantly from 1997 through 1999. During 1997 FPL replaced 14.8 percent more transformers than the previous year, while replacements during 1998 and 1999 were 45.3, and 15.3 percent, respectively, above the 1996 level.

Florida Power & Light Transformer Replacement 1992--1999								
	1992	1993*	1994	1995	1996	1997	1998	1999
Transformers Replaced	22,309	22,187	19,316	16,108	16,989	19,500	24,678	19,586
Total Install Cost (\$000)	\$30,313	\$31,095	\$26,252	\$22,144	\$24,384	\$31,413	\$38,128	\$28,461

EXHIBIT FPL-20

Source: FPL Responses to Document Requests

**Excludes the effect of Hurricane Andrew.*

3.4.6 Restoration/Repair

As mentioned in section 3.4.1, since the issuance of staff's 1997 reliability report, the functions of service restoration and repair have been redistributed from the now disbanded Distribution Operations to its two succeeding organizations, Urban and Suburban Operations, as indicated on **Exhibit FPL-21**. Statewide accountability for reliability and restoration operations belongs to the Directors of Urban and Suburban Operations and their combined total Restoration Managers. These positions are responsible for minimizing the duration of interruptions and coordinating activities with the area managers in deploying field forces and other resources. The Restoration Managers are also responsible for FPL's 33 consolidated Service Centers, which provide the communication link within FPL's operations and the affected customers.

Customers calling in to report a service problem may either speak directly with a Customer Service Representative or, by responding to various telephone prompts, may respond via FPL's automated Voice Recognition Unit through their touch-tone telephone keypad. In either case, the information is entered into the newly updated Trouble Call Management System II (TCMS-II), which creates a work order commonly referred to as a "trouble ticket." Depending upon geographical location, the trouble tickets are routed to one of four Dispatch Centers. The TCMS-II analyzes the trouble tickets, grouping those that may be related, and they are dispatched to field forces for investigation and resolution. TCMS-II stores data including the type of problem reported, the time reported, the dispatch time, the type of repair or maintenance work completed, and the time the service was restored. At year-end 1999, FPL reported that there had been no changes in the way trouble tickets are coded or prioritized from the process reported in 1997.

**FLORIDA POWER AND LIGHT
DISTRIBUTION OPERATIONS
JUNE 1999 ORGANIZATIONAL CHART**

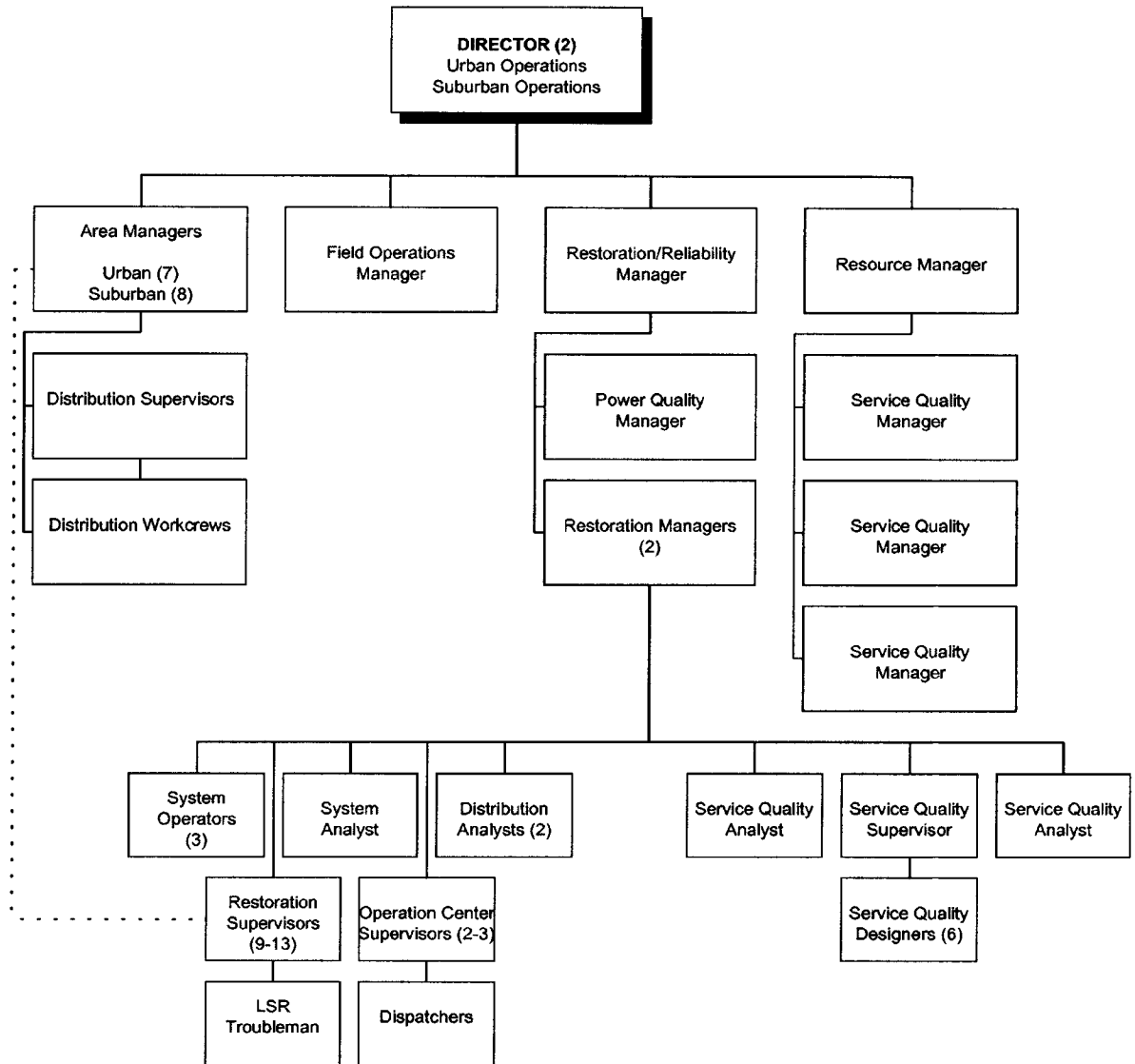


EXHIBIT FPL-21

Source: FPL Document Requests 2-8.

FPL's Trouble Call Management System-I was updated in 1998. FPL states TCMS-II was originated, specified, and designed as a replacement to Trouble Call Management System-I in order to address issues surrounding Y2K compliance, Windows-based usability, and wide area network and local area network platform configurations. In addition, TCMS-II data can be used for analysis of distribution reliability and restoration performance. TCMS-II uses virtually the same data sources and processing for customer outage inputs, ticket device analysis, and ticket allocation as TCMS-I. FPL notes the changes made in designing TCMS-II were not for improvements to service quality or reliability but to offer significantly enhanced features for seamless boundary dispatch and manage reporting options.

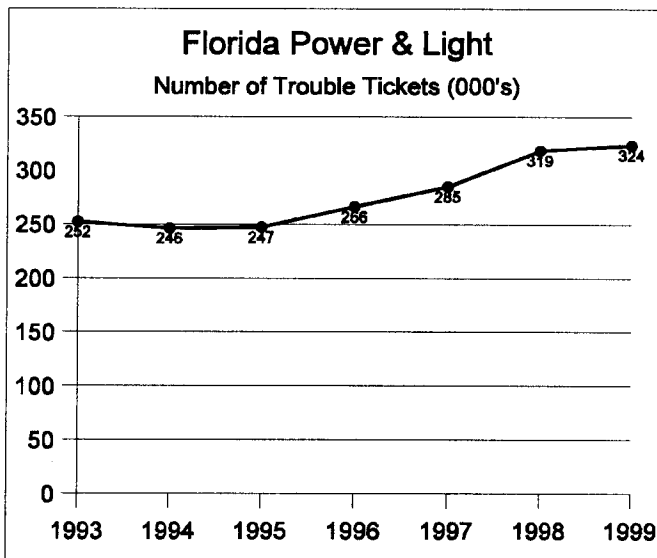


EXHIBIT FPL-22

Source: FPL Response to Document Request 1-48, 2-1, & 5-11

The total volume of trouble tickets handled can provide a measure of repair workload and frequency of problems experienced by customers. The number of trouble tickets created and investigated by FPL has increased in recent years, as shown in **Exhibit FPL-22**.

As shown in Exhibit FPL-22, the annual number of trouble tickets issued by FPL has continued the steady increase begun in 1996, though year-end totals for 1999 increased at a lower rate. This upward trend follows a period of three years where the number of trouble calls remained relatively constant and even decreased slightly from 1993 to 1994.

Exhibit FPL-23 displays average annual arrival minutes by priority code (indicating the severity of the customer's

reported problem) for FPL Restoration/Reliability personnel responding to trouble calls. As the table indicates, beginning in 1997 and continuing through 1999, the average arrival time for investigators appears to have reversed the upward trend noted in staff's 1997 report. FPL finished 1999 with a total average of 54 minutes for investigator arrival—down 25 percent from 1997's average. As reported in 1997, FPL states that repair, maintenance, or restoration work prioritization is based solely upon safety (both public and equipment) considerations and numbers of customers affected.

Florida Power & Light Average Trouble Call Investigator Arrival Minutes 1993 Through 1999							
Priority Code	1993	1994	1995	1996	1997	1998	1999
1	55	39	44	46	44	49	34
2	69	56	66	72	70	67	53
3	58	56	69	80	78	67	56
4	67	66	85	97	96	87	72
Weighted Overall Average	61	57	70	80	72	68	54
Priority Code 1: Feeder interruptions and/or any potentially hazardous condition (injury, fire, pole/wire down). Priority Code 2: Customer reporting problem recurring same day after problem initially reported, treated and resolved. Priority Code 3: All other troubles involving a single no-current or partial no-current condition. Priority Code 4: All other troubles involving no loss of service.							

EXHIBIT FPL-23

Source: FPL Response to Document Request 1-35, 2-6, & 5-12

Corporate-wide staffing reductions at FPL reduced the number of restoration and maintenance trouble men and crew members in recent years. As shown in **Exhibit FPL-24**, these employees numbered 894 in 1995 before falling and remaining in the range of 761 to 769 through 1999. The one exception in these staffing levels occurred in 1998 when transfers increased Restoration and Maintenance employee levels to 962. As described in staff's 1997 report, information for specific job category breakdown before 1995 was not retained by FPL and is not available. Over the period of 1992 through 1997, the total reduction in distribution bargaining unit employees was 26.7 percent.

Over the 1992 through 1999 period, FPL's number of Distribution fleet vehicles, including repair and maintenance vehicles, declined but at a lower rate than total bargaining unit employees. As shown in **Exhibit FPL-25**, in 1992 the fleet numbered 3,291 vehicles, the number declined to 3,081 in 1997, and the number for both 1998 and 1999 stood at 2,877. This represents a total decrease of over 12.5 percent for the eight-year reporting period.

Florida Power & Light Staffing Comparison of Distribution Bargaining Unit Employees 1992-1999										
Job Category	1992 Actual	1993 Actual	1994 Actual	1995 Actual	1996 Actual	1997 Actual	1998 Actual	1999 Actual	1992- 1998 Revised Change (%)	1995- 1998 Revised Change (%)
Restoration & Maintenance	NA	NA	NA	894	769	762	962	761	NA	7.6%
Construction	NA	NA	NA	725	776	500	385	337	NA	(88.3%)
Other Support	NA	NA	NA	482	476	476	472	772	NA	(2.1%)
Total*	2,550	2,363	2,247	2,101	2,021	1,738	1,819	1,870	(40.1%)	(15.5%)

EXHIBIT FPL-24

Source: FPL Response to Document Request 1-21, 2-6.

* Excludes overtime full-time equivalents.

3.5 Recent Trends and Changes

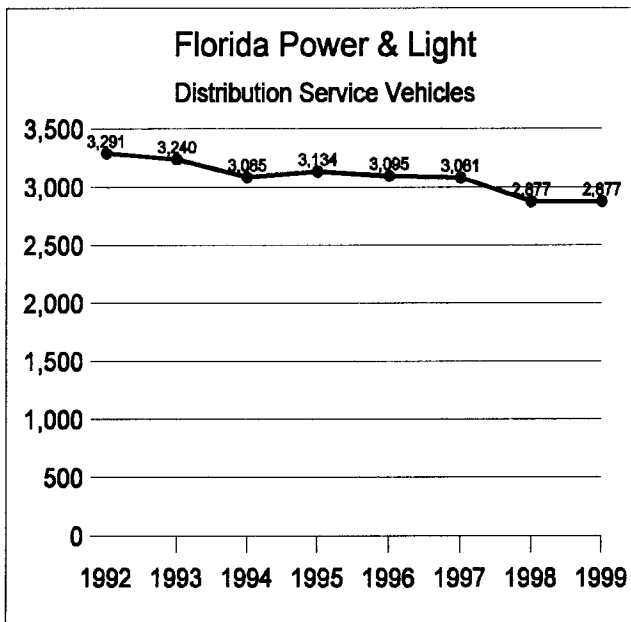


EXHIBIT FPL-25

Source: FPL Response to DR 1-15 and 5-13.

FPL's 1997 *Environmental Assessment Report* itemized a list of recommendations that FPL should pursue to garner better customer satisfaction levels. From these recommendations, FPL formed teams to address specific issues as described in section 3.5.2 of the 1997 *Review of Electric Service Quality and Reliability* report. The findings of those teams resulted in changes to FPL's work processes and maintenance practices as designed within the company's Reliability 2000 initiative (which has also become the company's yearly maintenance program). FPL reports all of the recommendations have been incorporated into its everyday work processes. Examples of some of those changes include the Thermovision program, Estimated Time of Repair and Initial Time of Repair program (ETR/ITR),

Multiple Interruption Program, and continuance of yearly updates to the Environmental Assessment report.

3.5.1 Distribution Environmental Assessment

Thermovision and Multiple Interruption Programs

As described in staff's 1997 report, FPL's *Environmental Assessment Report* spawned the creation of four "tactical teams," two of which specifically addressed the reliability areas of feeders that experience multiple interruptions (outlier feeders). As a result of their efforts, the two teams identified and targeted 22 feeders with high numbers of interruptions and 36 feeders with high numbers of Momentaries. In early 1998, the tactical teams were disbanded, and the two teams responsible for outlier feeders were incorporated within two new programs—the Thermovision and Multiple Interruption programs.

The Thermovision program incorporates the use of four special-purpose vans equipped with standard and infrared scanning/imaging equipment used to identify "hot spots" on overhead feeders and vaults. While the equipment operator in the van images equipment and inputs results into a computer, the driver makes a visual observation of the overhead line. Anomalies identified via visual inspection are also input into the computer, and all information is downloaded daily. A monthly report, including images, is distributed to each of the area managers for appropriate action (typically, a work or service order is generated). Currently, feeders and other devices are on a five-year cycle of inspection. The company planned for 500 feeders to be scanned in 1999 (actual numbers have not been provided) In 1999, FPL spent just over two million dollars on the Thermovision program. During 1998, 547 feeders were scanned at an operating cost of \$450,000. This resulted in repairs of \$2 million in combined O&M and capital expenditures.

Initial Time of Restoration and Estimated Time of Restoration

In June 1998, FPL enacted an enhancement to its trouble reporting process that provides an estimated restoration time to customers calling to report an outage. The initial time of restoration provided to customers is based upon historical performance information. The diagnostic analysis performed by TCMS-II identifies preliminary information regarding the equipment that may have a problem and the historical restoration performance for that equipment at that time of day and in that geographic area. As additional information becomes available, field conditions are assessed, and the restoration estimate is updated. During the initial call, customers are advised that the estimate is preliminary and that they may wish to call back later for an updated restoration estimate. FPL has determined that providing restoration updates to customers may improve customer satisfaction with outage handling.

Multiple Interruption Program

FPL's Multiple Interruption program became part of the company's over-all Reliability 2000 program in 1998. The program was designed to address feeders, OCR's, laterals, and transformers that had multiple interruptions (four or more interruptions for feeders and OCR's or five or more interruptions on laterals and transformers). The program consists of a review of the devices' interruption history to identify recurring problems and/or specific problems that need to be investigated via field inspection, Thermovision, and the related follow-up countermeasures as

needed. In 1998, a total of 2,369 transformers had experienced more than 10 interruptions. For 1999, FPL's business unit targets for inspection are 1,562 transformers and 3,513 customers with greater than 10 interruptions.

Other Programs

To address the outlier feeders identified by the 1997 tactical teams, specific countermeasures were implemented to improve performance. These countermeasures incorporated the efforts of both the 1997 tactical teams, as well as efforts later submitted in 1998 as part of FPL's Reliability 2000 program. According to FPL, problem feeders identified by the tactical teams in 1997 were visually inspected and analyzed. Based on the results of the analysis, specific actions were taken during the latter part of 1997 to address the cause of feeder and lateral failures. Predominant corrective action has been in the following areas:

- ◆ Lightning protection
- ◆ Repair and restoration of deteriorated facilities
- ◆ Tree trimming

During 1998, additional projects were undertaken to address outlier feeders by the new Outlier Feeder and Momentary Interruption Programs of Reliability 2000. By mid-year 1998, corrections were made to each feeder identified as a result of either of the two programs. Each feeder that appeared on one of the lists was given a Thermovision inspection to spot problems not apparent during the visual inspection that was performed by the 1997 tactical teams. Results of the outlier repair efforts are entered and monitored by FPL via an on-line database.

As a result of these efforts, FPL's 1998 Annual Distribution Service Reliability Report, filed in March 1999, indicates 96 percent of the feeders appearing on the 1997 worst-performing list are no longer on the list. With the progress made on the previously identified worst-performing feeders, additional feeders that perform poorly will be addressed via the Multiple Interruption and Thermovision programs of Reliability 2000.

Exhibit FPL-27 shows continuing results in the effort begun by the former tactical teams and continued by the Outlier Feeder Program of Reliability 2000 to reduce momentaries and interruptions. The teams identified 22 feeders with high numbers of interruptions and 36 feeders with high numbers of momentaries. These exhibits depict the data to provide a visual orientation of the trend from 1997 through 1999. As these exhibits illustrate, 1997 saw significant reductions in numbers of both interruptions and momentaries, with decreases generally continuing through 1999.

Line Patrol and Inspection

Until 1995, FPL performed routine patrol/inspection based upon available resources and workload. The problems identified by this activity generated work tickets, which were routed to the responsible area manager. In late 1995, this practice was discontinued when FPL determined that the company received "minimal benefits derived from these patrols" versus those discovered and addressed by service center employees through normal daily activities.

FPL's *Reliability 2000 Plan* calls for efforts to identify and replace lines and other system components over the 1998 through 2000 period. The plan is discussed in section 3.5.4.

Florida Power & Light Momentaries and Interruptions Preliminary Results 1996-1999												
Monthly Momentary Comparison on 36 Feeders												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1996	471	164	261	122	244	420	256	342	273	220	204	227
1997	83	51	70	105	137	194	269	215	98	48	49	39
1998	38	144	50	42	95	186	158	181	151	60	61	46
1999	60	36	43	94	104	163	131	212	69	49	41	51
Monthly Interruption Comparison on 22 Feeders												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1996	13	9	14	9	13	13	9	7	19	13	33	25
1997	0	3	6	6	9	11	14	13	5	10	5	6
1998	2	4	1	2	5	5	2	6	5	6	2	4
1999	6	3	3	4	4	4	5	5	2	2	2	2

EXHIBIT FPL-26

Source: FPL Response to DR 2-31 and 5-14.

3.5.2 Reliability 2000

The *Reliability 2000* program, formally approved by FPL executive management in November 1997, has developed into the company's on-going annual reliability and maintenance plan addressing all distribution system improvements needed, including those identified in the annual *Environmental Assessment*. To illustrate, **Exhibit FPL-28** identifies specific reliability programs that address the various reliability and maintenance issues and provides updated actual and budgeted dollar amounts through 2000. As the exhibit indicates, actual expenditures increased \$19.5 million in 1998 over 1997 expenditures, with increases in spending of \$19 and nearly \$20 million in 1999 and projected 2000. As was the case in 1997, the *Reliability 2000* (R2K) plan dedicates additional budget money to ongoing infrastructure improvements and customer programs not identified in Exhibit FPL-27.

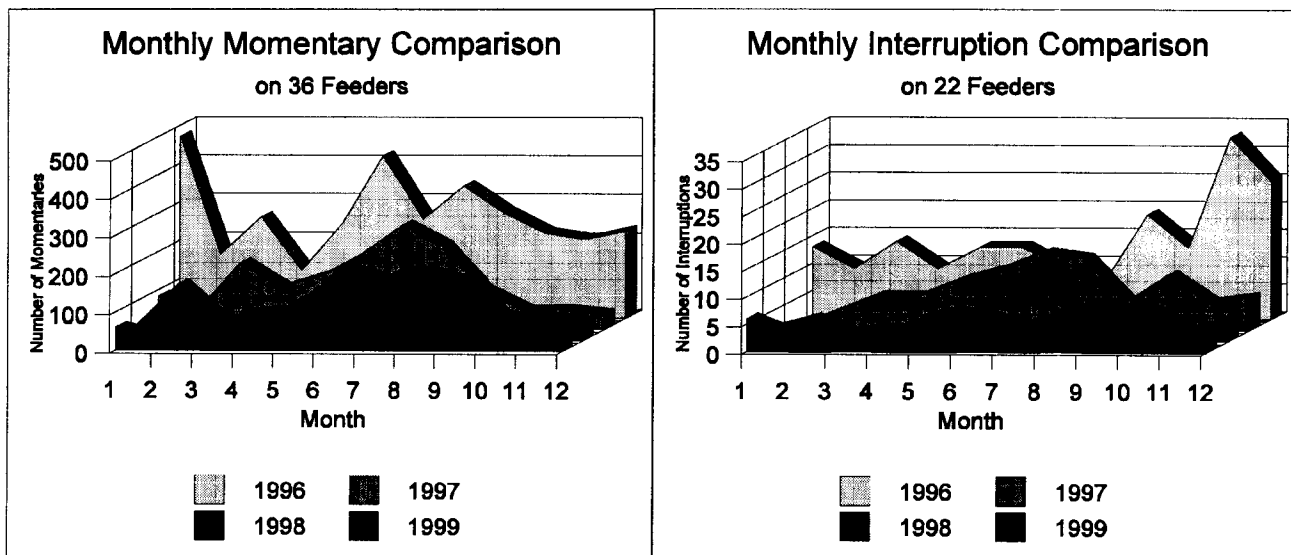


EXHIBIT FPL-27

Source: FPL Response to DR 2-31 and 5-14.

According to FPL, R2K continues to be a comprehensive assessment and work plan identifying reliability goals and priorities through the year 2000 and beyond. FPL notes that the plan will continue to target service interruptions, momentary interruptions, and service restoration time through initiatives including reviews of company practices involving tree trimming, conductor (line) replacement, system design standards, and the service restoration process. FPL indicates the plan will continue to include an assessment of distribution components such as transformers, cable performance, and lightning and grounding protection.

During October 1997, FPL made changes to the distribution field operations organizational structure depicted in Exhibits FPL-10 and FPL-21. These recent organizational changes were intended to facilitate the implementation of the *Reliability 2000* program by enhancing the attention given to the plan's specific programs and initiatives. The June 1999 organizational structure is depicted in **Exhibit FPL-29**.

As reported in 1997, the results of *Reliability 2000* are critical to the trend of many of the measures of distribution service quality discussed in this report. Although the program will continue to require more time to show its full effect, some results can be observed in the interim. FPL reports that *Reliability 2000* reliability projects are responsible for the improvement in the company's internal service quality indicators (discussed in section 3.3) that include SAIDI (SU), CAIDI, SAIFI, as well as customer inquiries and complaints (section 3.3.2), and customer satisfaction (section 3.3.3).

**Florida Power & Light
Reliability 2000 Programs
1997- Projected 2000
Capital and O&M (\$000)**

	1997	1998	1999	Proj. 2000	
Restoration Initiatives	\$ 1,300	\$ 3,645	\$188	\$560	No loss of service, Feeder balance, TLM data corrections.
Distribution Automation	742	156	0	1,390	1999: Repair and relocate 288 automated switches, 1999: Install 400 new switches. 2000: Maintenance as needed.
Feeder Telemetry	2,000	1,545	1,500	2,900	1998: Install feeder telemetry on 191 feeders in Dade & Broward. 1999: Complete Dade & Broward and remainder
Worst Performing Feeders-Changed To Outlier Feeder For 1998	1,541	3,227			Interim program, through 1998 to improve 50 poor performing feeders.
Lateral Outliers	N/A	1,643			Interim program, through 1998 to improve 150 poor performing laterals. Note: \$7.3 million in 1999 and 2000 to address feeders/laterals experiencing multiple interruptions.
Vegetation Management	22,700	28,500	31,249	31,500	Increased funding for next 3-5 years to regain control of growth affecting FPL facilities. First 3 year cycle begins in 1999.
Lightning Protection-Program	N/A	936	included in Thermo-vision (below)	included in Thermo-vision (below)	Correct lightning protection on 37 feeders system wide. Work with Distribution Engineering to evaluate standards.
Cable Replacement-Feeder	420	8,584	9,791	6,098	Replace failing feeder cable after the fourth failure. Replace worst 38 miles of critical cable (failed 4 or more times). Replace 460,000 feet per year after 1998
Thermovision	N/A	N/A	2,058	2,331	Provide thermal and visual inspection an 319 feeders including lightning protection.
Multiple Interruption	N/A	N/A	2,987	3,888	Improve feeders, laterals, and transformers experiencing multiple interruptions.
Program Totals	\$28,703	\$48,236	\$47,773	\$48,667	
Increase Over 1997 Spending	---	\$19,533	\$19, 070	\$19,964	

EXHIBIT FPL-28

Source: FPL Responses to Document Requests 1-2, 1-23, 5-15.

3.6 Conclusions

By many indications, FPL has begun a reversal of its previous downward trend in electric service quality and reliability experienced from 1992 through 1997. As previously reported, in early 1997, FPL began to take extensive actions to reverse this decline, including a strategic plan that sharply contrasts the cost-cutting approach employed during much of this decade. In 1997, FPL began allocating an additional \$84 million dollars to improve its distribution network over the following three years through the company's *Reliability 2000 Plan*. During 1998, actual expenditures increased by \$55.9 million over 1997 spending, followed by an additional \$67.4 million for year-end 1999.

As reported in 1997, FPL's response has also included management changes and restructuring in the Distribution Business Unit, as well as identification and assessment of weaknesses. These efforts have yielded some promising preliminary results. The company's key SAIDI and CAIDI indexes have apparently benefitted from FPL's recognition of its need to change the territorial mentality in the service restoration function. These changes have allowed FPL to more appropriately utilize its field workforce, which was reduced significantly in recent years.

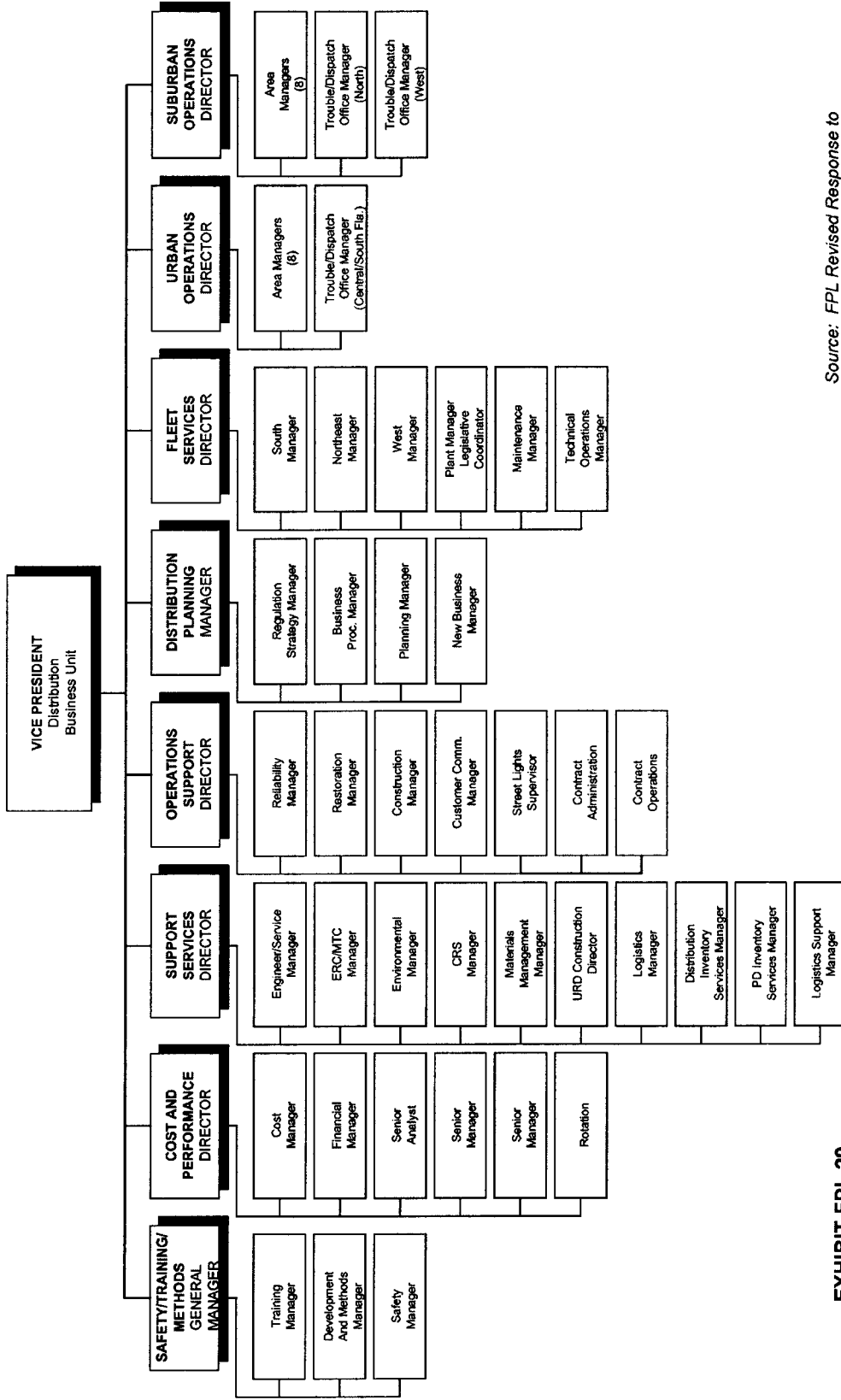
Changes made to give additional attention to customers' needs and expectations have apparently been effective, as demonstrated in the dramatic drop in FPSC logged service complaints (Exhibit FPL-1). Substantial increases in tree-trimming budgets mentioned in the 1997 report have continued through 1998 and 1999.

Clearly, FPL has made progress since the 1997 FPSC reliability report was issued. Although performance measured by many of the indicators does not yet compare favorably to 1992 levels, the trend is clearly toward improvement. It should be noted that the 1992 levels reflected a significant exclusion due to Hurricane Andrew. Results of FPL's continuing efforts to improve service quality and reliability can continue to be measured by the existing company indicators and through monitoring by FPSC Staff.

As the voluntary five-year reporting period for expanded reliability indices comes to an end, it will be important to evaluate the effectiveness of those measurements, and determine if they should be kept, or modified, or some combination. Florida electric utilities and the Commission are currently studying the best means of measuring reliability in the future by way of a straw man proposal due from each of the companies by November 30, 2000. At the May 2000 Distribution Reliability Report meeting, staff asked for each utilities' proposal to provide two items of information:

1. Provide a working definition of reliable and adequate electric service, and
2. Describe the necessary reporting requirements to fit the above definition.

**FLORIDA POWER AND LIGHT COMPANY
DISTRIBUTION OPERATIONS
JUNE 1999 ORGANIZATIONAL CHART**



Source: FPL Revised Response to Document Request 1-1, 5, 13, and 19.

EXHIBIT FPL 29

4.0 FLORIDA POWER CORPORATION

4.0 Florida Power Corporation

4.1 Company Profile

Florida Power Corporation (FPC) is the second largest investor-owned electric utility in the state of Florida. FPC is a subsidiary of Florida Progress Corporation with a pending acquisition by Carolina Power & Light (CP&L). At the end of 1999, FPC had 4,740 employees and operating revenues of \$2.63 billion.

The company currently serves 1.37 million customers in 32 of Florida's 67 counties, covering an area of about 20,000 square miles, primarily in central and north Florida. FPC's service territory includes areas around Orlando, the cities of St. Petersburg and Clearwater, and rural North Florida localities. By the end of 1999, FPC's 15 generating units had a total electric generating capacity of 8,267 megawatts of power (winter) with 4,700 miles of transmission lines and more than 25,000 miles of distribution lines.

In anticipation of competition, FPC reorganized its operations into the following three strategic business units in 1996: Energy Supply, Energy Solutions, and Energy Delivery. Any potential impact of the acquisition by Carolina Power & Light on FPC's organizational structure and operations is not known at the time of this report.

FPC's power generation group, Energy Supply, is responsible for overseeing the company's fossil fuel (coal, oil, and natural gas) and nuclear operations. Specific responsibilities include construction of new power plants, power generation, and maintaining maximum efficiency of power.

Energy Solutions is the customer services arm that focuses on sales, marketing, and finding new ways to use emerging technology to develop new products and services. The Energy Solutions group is responsible for credit and billing functions as well as measuring customer satisfaction and guiding FPC in making improvements in customer service.

Energy Delivery, the primary focus of this review, oversees FPC's transmission and distribution lines as well as system operations and planning. Responsibilities include construction, maintenance, engineering, and power restoration of the company's transmission and distribution network.

4.2 FPC'S Response to the 1997 ESQ Report

In response to the Bureau of Regulatory Review staff's 1997 report, FPC acknowledged that the trend for customer reliability was not satisfactory. In fact, FPC had already begun actions to reverse this decline in 1996. This report addresses the progress FPC has made in 1998 and through 1999. The company's goals included the following:

- ◆ Reduce SAIDI as the main indicator in regards to reliability and also reduce CAIDI, SAIFI, and Multiple Interruptions (MI). Company goals and progress are reported in Section 4.3.2.
- ◆ Correct all reporting data to conform to Rule 25-6.044(1). This is also discussed in Section 4.3.2.
- ◆ Achieve reliability goals listed in Section 4.6, and Exhibits FPC-24 & FPC-25.

4.3 FPSC Service Quality Indicators

The two key indicators of service reliability monitored by the FPSC are customer complaints received by the Division of Consumer Affairs and the annual reliability reports filed by electric utilities. This section examines and compares current year indicators to prior years and provides an assessment of the collected data.

4.3.1 FPSC Customer Complaints

Direct questions or concerns to FPC that are not resolved to the customer's satisfaction may result in a customer complaint filed with the FPSC. Beginning in 1996, customer complaints received were categorized by FPSC staff as either a service or billing inquiry.

A history of service-related complaints logged against FPC for each of the years 1992 through 1999, is depicted in **Exhibit FPC-1**. As reported in 1997, FPC attributes the sharp increase in complaints from 1994 to 1995 to deployment and roll-out issues related to a new customer service computer system.

In 1997, a notable reversal occurred with complaints dropping to 117, a decrease of 35 percent from 1996. During 1998, the decline continued as total complaints dropped another 30 percent to 82. For 1999, FPC had 105 complaints and management explains the rise was due to an abnormally active storm season. According to FPC, the decreases in 1997 and 1998 are due to the new customer service system, hiring an additional 19 new trouble department employees, and internal company responsiveness.

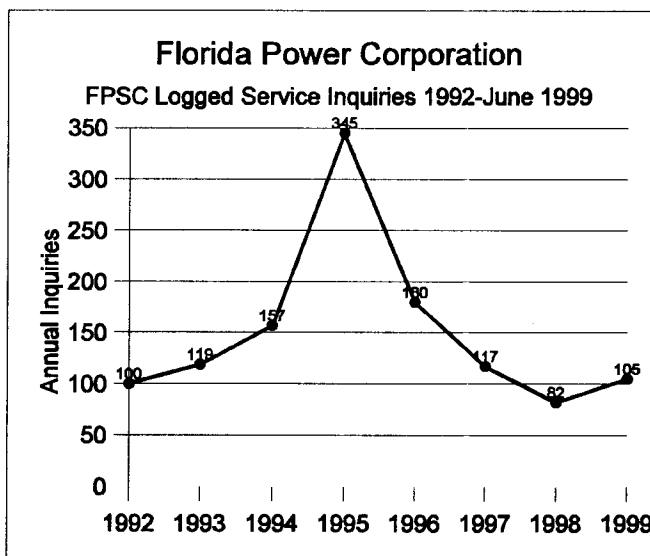


EXHIBIT FPC-1

Source: FPSC Consumer Activity Reports 1992-1996 & DR1-48 & 2-3.

4.3.2 FPSC Distribution Service Reliability Report and Quality Indicators

The FPSC's annual distribution service reliability report requires each utility to report: annual number of service interruptions (N) sorted by cause, the average length of all interruptions (L-Bar), and the three percent of the utility's feeders with the highest number of interruptions. Beginning in 1999, the FPSC Service Reliability Report also included SAIDI, CAIDI, and SAIFI, which are voluntarily reported.

A history of FPC's number of service interruptions, categorized by cause for the years 1992 through 1999 is provided in **Exhibit FPC-2**. It should be noted that FPSC Rule 25-6.0455 requires that all prearranged outages and outages due to transmission, relay, generation, and customer problems be excluded from the annual report. FPC's results indicate that the total number of interruptions steadily increased from 1992 through 1997. A notable improvement began in 1998 with a reduction in interruptions by 11.1 percent over the prior year. However, interruptions increased during 1999 by 5.7 percent. The 1999 figure still represents a 6 percent improvement over 1997.

Exhibit FPC-3 takes Exhibit FPC-2 a step further by showing the most frequent causes of interruptions for the years of 1992 through 1999. The top three causes in each year were "other" (outside the reporting categories specified by FPSC Rule 25-6.0455), tree, and animal. Several causes that make up the category of "other" include connector failures, defective equipment, human error, storm/wind, and underground primary cable. Although FPC's projected breakdowns for 1999 included an increase in interruptions attributed to "other," it projected a decrease in interruptions caused by trees. During 1998, this category has increased beyond 1997 levels.

Exhibit FPC-4 depicts FPC's average length of interruptions using the L-Bar duration in minutes provided in the FPSC annual reports. It should be noted that L-Bar averages the lengths of all interruptions equally without considering the number of customers affected by each interruption. Over the period of 1993 through 1996, the average length of interruptions grew 29 percent from 90 minutes in 1993 to 109 minutes in 1996. L-Bar decreased slightly in 1997, and then it increased in 1998 to 113. For 1999, L-Bar has dropped three minutes to 110.

An examination of FPC's three percent "worst-performing feeder" list shows a pattern of feeders repeatedly making the list. As reported in the 1997 review, over the period of 1993 to 1996, one feeder appeared on the list for all four years. However, in 1997 that feeder has dropped from the list. In contrast, for the years 1997 and 1998, three different feeders made the same list. These "repeat offenders" represent identified trouble areas being experienced for two or more years without being fully resolved. To a certain extent, some feeders, such as long rural circuits, may continue to be problematic. FPC's effort to combat its worst-performing feeders is discussed further in Sections 4.5.3 and 4.5.5.

**Florida Power Corporation
Total Interruptions by Category
1992-1999**

Cause	1992		1993		1994		1995		1996		1997		1998		1999	
	Total	%	Total	%	Total	%	Total	%	Total	%	Total	%	Total	%	Total	%
Animal	4,342	13	4,694	13	4,158	11	4,494	11	5,863	15	7,955	19	5,401	15	5,413	15
Corrosion	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dig-In	422	1	349	1	385	1	376	1	358	0	553	2	699	2	910	2
Lightning	3,540	11	3,093	9	3,949	11	2,778	7	3,658	9	3,922	9	3,138	9	3,188	8
Salt Spray	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Substation	69	0	99	0	66	0	90	0	51	0	0	0	0	0	0	0
Transformer	2,579	8	2,779	8	2,799	7	3,123	8	3,605	9	2,901	7	2,730	7	3,169	9
Tree	4,286	13	4,429	13	5,421	14	6,844	17	7,295	18	5,811	14	5,869	16	4,775	12
Unknown	2,755	8	2,912	8	2,816	7	4,143	10	3,985	10	4,514	11	4,445	12	5,372	15
Vehicle	430	1	461	1	443	2	457	1	383	1	325	1	394	1	444	1
Other	15,147	45	16,406	47	17,549	47	17,201	43	15,184	38	15,400	37	14,126	38	14,744	38
Total	33,570	100	35,222	100	37,586	100	39,506	100	40,382	100	41,381	100	36,802	100	38,901	100

EXHIBIT FPC-2

Source: FPSC Reliability Reports 1992-1998 and Document Request 2-16.

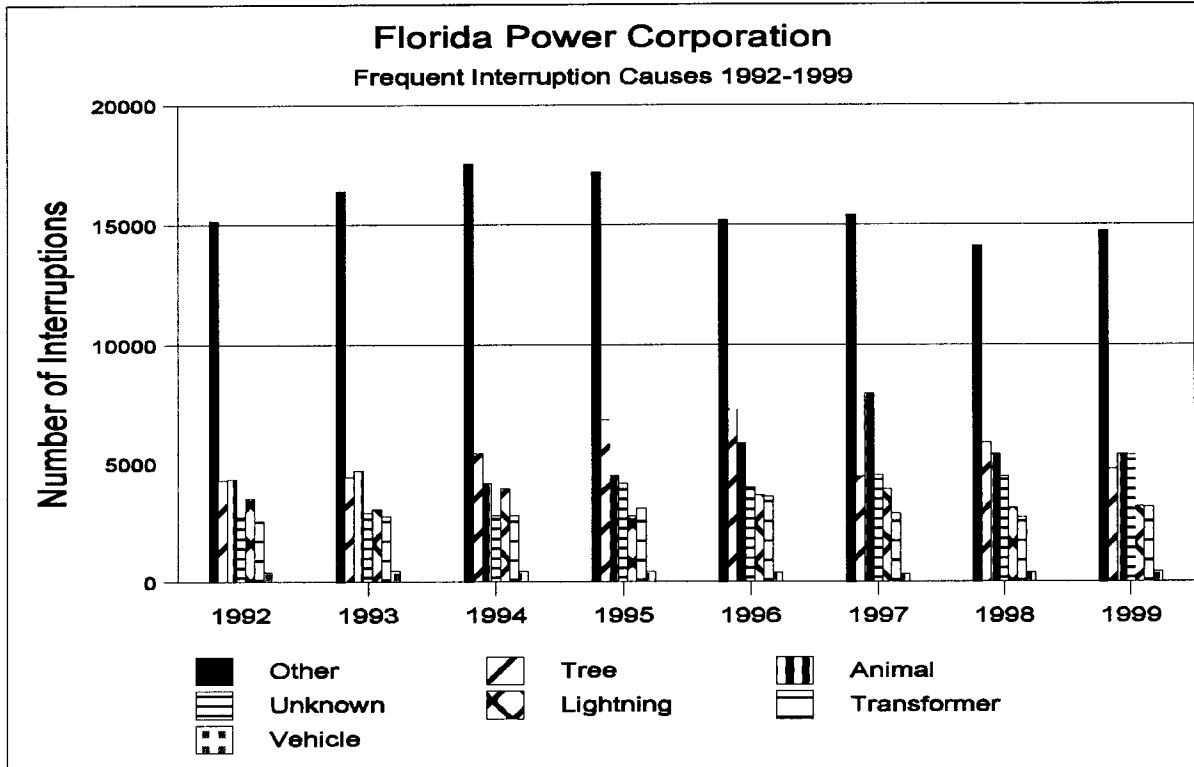


EXHIBIT FPC-3

Source: FPSC Reliability Reports 1992-1998 & Document Request 2-16.

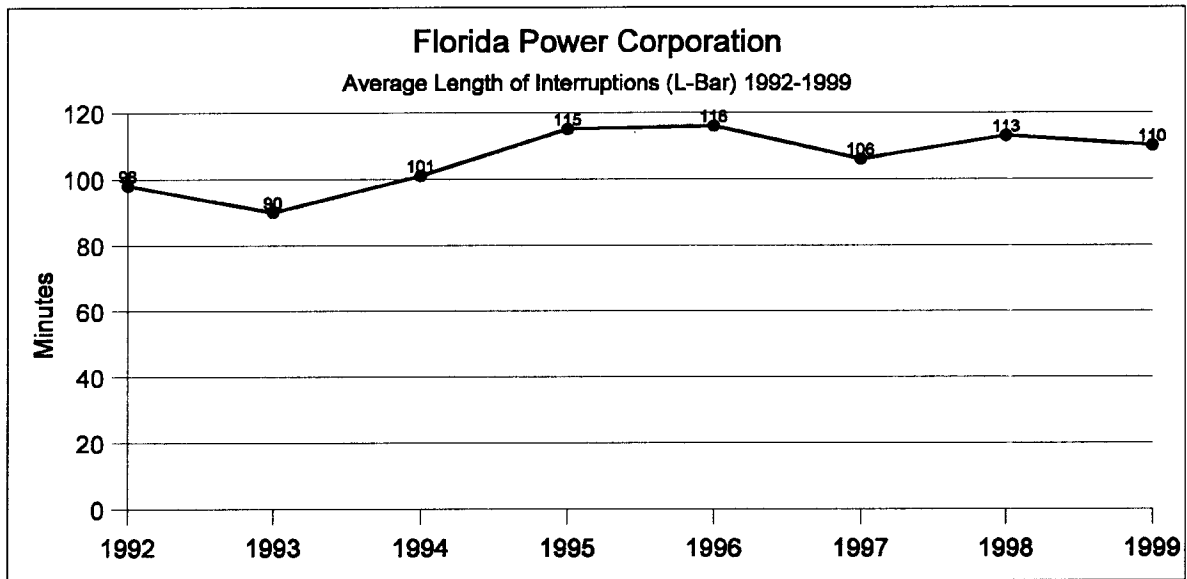


EXHIBIT FPC-4

Source: FPSC Reliability Reports, 1992-1998 and DR 2-1.

System Average Interruption Duration Index

The primary indicator of overall system distribution service reliability tracked by FPC is Customer Minutes of Interruption Index, abbreviated as CMI/C and also known throughout the electric industry as SAIDI (System Average Interruption Duration Index). CMI/C measures the *average duration* of an interruption for all customers served. CMI/C is determined by dividing the sum of all customer minutes of interruption by the average number of customers served. In calculating CMI/C, FPC excludes named storms and tornadoes in accordance with FPSC rule 25-6.044. Under this exclusion, which would apply, for example, to a hurricane, FPC would be so highly mobilized for service restoration that normal outage reporting procedures would be suspended and customers would reasonably expect service to be out for an extended period of time. It should be noted that prior to 1998, FPC did not use this exclusion. However, 1992-1999 indices are now adjusted and, therefore, reflect performance on a basis consistent with other Florida utilities.

Exhibit FPC-5 depicts FPC's CMI/C data over the period of 1992 through 1999. In 1996, CMI/C reached its peak in interruptions over the prior five-year period, but 1997 was a year of improvement. The company set goals to improve CMI/C to 145 minutes in 1997 and 125 minutes in 1998. As shown in **Exhibits FPC-5** and **FPC-6**, the company achieved those goals. FPC was striving for an average annual improvement of 14 percent over the period of 1997 to 2000. In 1999, SAIDI decreased to 97 minutes, which was just below the goal of 100 minutes. FPC attributes this improvement in CMI/C to four areas of concentration: reducing the frequency of outages, tree trimming, recloser change-outs, and the SCORE program (see Section 4.5.5).

A component of CMI/C is the average outage duration for customers interrupted, otherwise known as CAIDI (Customer Average Interruption Duration Index) in the electric industry. CAIDI is determined by dividing the sum of all *customer minutes of interruption* by the *number of customer*

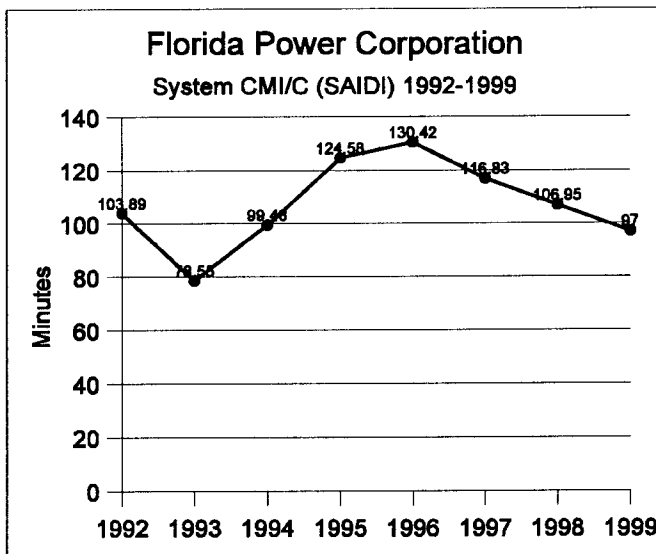


EXHIBIT FPC-5 Source: FPC Response to DR 1-6, 1-12, and 2-1.

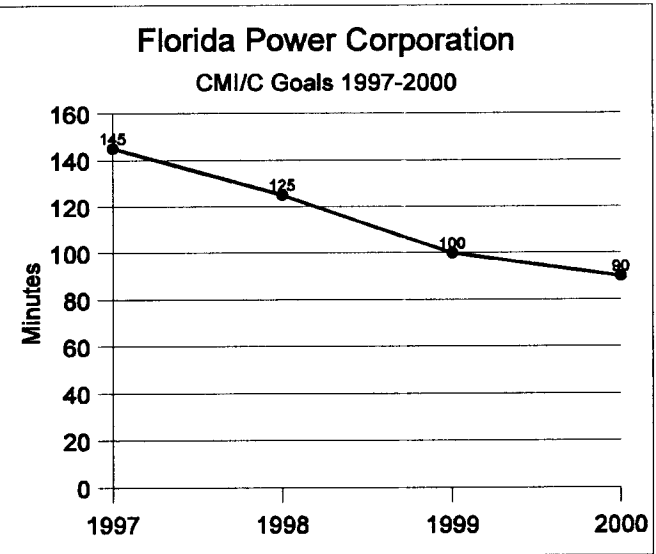


EXHIBIT FPC-6 Source: FPC Energy Delivery Reliability Orientation August 15, 1997.

interruptions. CAIDI is FPC’s primary internal indicator for assessing response time—the time elapsed from when a customer reports an interruption until their service is restored.

Exhibit FPC-7 presents FPC’s system CAIDI indices for the period of 1992 through 1999. As can be seen, CAIDI peaked in 1995, representing a 32 percent increase in average outages over 1993. FPC’s CAIDI index dropped to about 72 minutes in 1996. The indicator has stayed relatively the same for the last three years. As noted, the improvement in 1999 constitutes a drop back to the 1996 level. FPC attributes the three-minute increase in 1997 and 1998 to the Virtual Call Center that was created in 1996. Simply put, through this more effective system, customers report outages sooner. The result was increased company response time. The Virtual System is discussed in more detail in Section 4.4.1.

System Average Interruption Frequency Index

Another component of CMI/C is the average frequency of outages, or SAIFI (System Average Interruption Frequency Index). It is determined by dividing *the total number of customer interruptions* by *the average number of all customers served*. In other words, this index indicates the *number of times* per year that *the average* customer can expect to be out of service. **Exhibit FPC-8** depicts FPC’s system SAIFI numbers for each of the years 1992 through 1999. As noted, SAIFI increased during 1994 through 1996, further indicating FPC experienced a decline in reliability during that period. However, by the end of 1999, SAIFI had declined to 1.35 occurrences per year, a seven-year low.

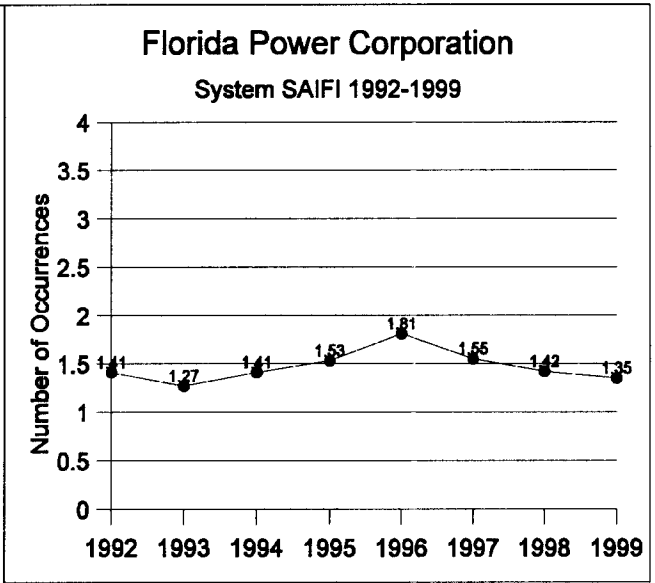
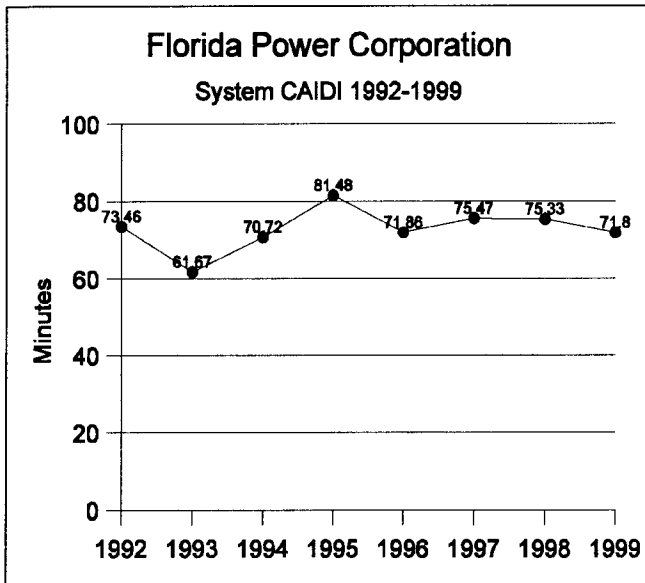


EXHIBIT FPC-7

Source: FPC Response to DR 1-12 & 2-1.

EXHIBIT FPC-8

Source: FPC Response to Document Request 1-12 & 2-1.

4.4 Company Service Quality Indicators

A variety of internal measurements throughout the company are available for use in monitoring distribution operations. These key measurements include internal reliability indicators and utility-handled customer inquiries and complaints.

Other Indicators

Although CMI/C is FPC's primary index, the company also tracks a variety of secondary measurements to monitor system performance. Indices tracked since at least 1992 are as follows:

- Average number of customers whose service is interrupted by each interruption (ACPI).
- Multiple interruptions to the same customer (CAIFI).
- Percentage of customers experiencing a total of five or more interruptions in a year (Multiple Interruptions, MI).
- Percentage of customer minutes of interruption greater than two hours.
- Percentage of time during a given year that an average customer was in service (ASAI).

The Average Customers Per Interruption (ACPI) indicator is defined as the average number of customers whose service is interrupted by each interruption. FPC's system total ACPI for 1996 was 61, meaning that an average of 61 customers were affected per interruption. Since 1993, FPC's ACPI index had increased, on average, by 10 percent per year. By the end of 1997, FPC had made significant improvement, reducing ACPI to 49. FPC reported ACPI of 52 in 1998 and 47.6 in 1999.

The Customer Average Interruption Frequency Index (CAIFI) measures interruptions to the same customer. FPC's CAIFI for 1996 was 2.35, for 1997 it was 2.23, for 1998 it was 2.15, and for 1999 it was 2.02.

FPC also tracks the percentage of its Multiple Interruption (MI) customers who have experienced a total of five or more interruptions in a year. Over the period of 1994 through September 1997, an average of 5.2 percent of its customers was interrupted more than five times a year. In 1998, this percentage dropped to 4.8, and in 1999 MI has improved to 3.9 percent.

Another indicator monitored by FPC is the percentage of customer minutes of interruption greater than two hours. For each of the years 1997, 1998, and 1999, the percentages equated to 45, 45, and 44 percent, respectively.

FPC's Average Service Availability Index (ASAI) is the percent of time that customers were in service for a given year. ASAI is determined by dividing the *customer hours of service* by the *customer hours of service possible*. This index has been referred to as the "Reliability Index." FPC's ASAI, on average for 1999, was about 99.99 percent per year.

4.4.1 Utility-Handled Inquiries and Complaints

FPC's Customer Solutions organization tracks FPSC inquiries and courtesy calls, and beginning in 1996, the department began tracking internal "executive" office letters and calls directed to upper management. In 1997, FPC received 619 executive calls and 125 letters directed to executive offices. In 1998, FPC received 1,603 executive calls and 186 letters to the executive office. In 1999, FPC received 1,253 executive calls and 189 letters.

Although the trend appears to be increased customer complaints, FPC explains that it has changed its procedures and the way the calls are reported. Prior to 1998, the calls were not tracked consistently throughout the company, nor were they centralized in one department. As of December 1997, all calls are now handled and tracked through the Consumer Affairs Department. Also, it should be noted that calls and letters address virtually any subject. The new system facilitates good customer relations and can identify trends for improvement.

Exhibit FPC-9 provides a three-year historical breakdown of the processed calls in the outage category. The highest number of outage calls processed to date occurred in June 1999. Due to a high amount of thunderstorm activity, FPC received 23,348 calls. It should be noted that in March 1997, FPC added the capability for its Voice Response Unit to provide estimated restoration times. This resulted in customers calling back seeking an updated restoration time, which increased the number of total customer calls. Additionally, the increase in calls may partially be attributable to customers increased acceptance and awareness of using the Voice Response Unit system. If a customer's call cannot be handled automatically, it is routed out of the Voice Response Unit to the first available customer service representative. The service representatives are accountable for keeping records of their interactions with customers and may, using their best judgement, code the call by outage type.

4.4.2 Customer Satisfaction Surveys

In order to examine customer-related issues of particular concern, a comprehensive survey, identified as FASTRACK, takes a sample of residential customers and commercial customers who have an average monthly usage of less than 70,000 kWh. The results of the 1996 through 1998 FASTRACK surveys are summarized in **Exhibit FPC-10**. The focus, Energy Delivery, is measured by four factors: power quality and reliability, outage restoration, and line crew rating. Exhibit FPC-10 gives percentages of the customers who rated FPC at nine or ten on a scale of one to ten. For instance in 1998, 62 percent of those customers surveyed rated FPC at nine or ten, indicating a "good job to a extremely good job" in the delivery of power. From 1996 through 1998, energy Delivery's scores improved from 61 percent to 62 percent.

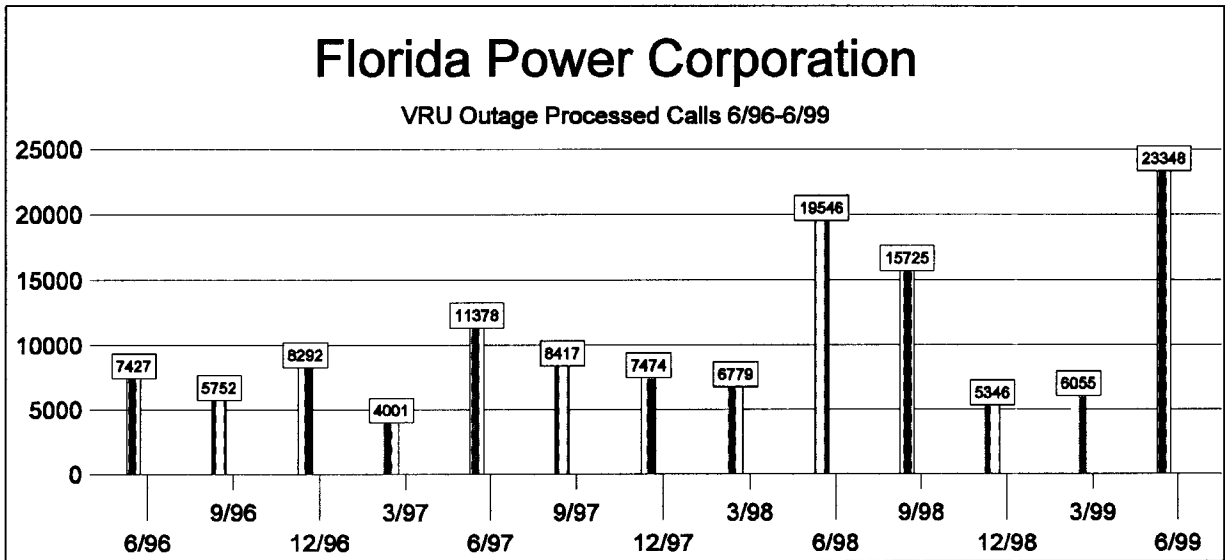


EXHIBIT FPC-9

Source: FPC Response to Document Request 2-3.

However, Florida Power Corp. believes its Customer Assessment Score (CAS) to be a more accurate reflection of customers' opinion regarding reliability. This survey is taken across the entire customer base. Since 1996, there has been a continued improvement in reliability satisfaction. To date, 94percent of Florida Power Corp's customers rate reliability as excellent/good.

Florida Power Corporation FASTRACK Survey Results Percent of Customers Rating FPC Good or Extremely Good 1996-1998				
	1996	1997	1998	1999 Goals
Energy Delivery	61%	61%	62%	64%
Customer Solutions	76	73	71	74
Energy Solutions	63	74	71	75

EXHIBIT FPC-10

Source: FPC Response to DR 1-47.

4.5 Distribution Organization and Service Quality Activities

The delivery of power to end-use customers is the responsibility of FPC's Energy Delivery Business Unit. As a result, this organization plays the major role in electric service quality since it

is responsible for both the maintenance and repair of the portion of FPC's system that actually brings power to customers.

4.5.1 Structure Staffing and Functions

As part of the company's new Energy Delivery business unit, FPC restructured and consolidated its distribution organization. During 1997, FPC began the process of extensive realignment of its distribution management and staff, as well as extensive redefining of job functions. According to FPC, the realignment was done as part of an overall effort to prepare for competition with the intent of improving power quality and service reliability.

Exhibit FPC-11 displays FPC's current Energy Delivery organizational structure highlighting seven positions directly accountable to the Vice President and their respective responsibilities. As shown, the department is headed by the Vice President of Energy Distribution with a Director of Engineering, Operations and Reliability, a Director of Distribution and Technology, a Manager of Product Delivery, and a Manager of Energy Distribution.

The Director of Engineering, Operations and Reliability is a position created in 1997 that is specifically responsible for monitoring reliability from a corporate-wide perspective. The position will utilize and apply the company's service reliability indicators described in Section 4.3.1. In monitoring system reliability, the director will be responsible for developing and directing the company's overall reliability and maintenance plan. In 1998, FPC added two more groups under the director's supervision. Currently, these five groups are System Maintenance, System Reliability, Facilities Utilization, System Operations, and Distribution Standards. Each group is headed by a manager as shown on **Exhibit FPC-12**. This current reporting structure supports strategy that balances costs, reliability, and the ongoing maintenance requirements of FPC's system. Further, these groups can issue directives specifically targeted at improving reliability and setting consistent procedures.

The System Maintenance group is responsible for developing, administering, and implementing system maintenance plans and programs (e.g., tree trimming, pole inspections). The System Reliability group is primarily responsible for monitoring system overall reliability operations (e.g., worst feeders) and direct reliability improvements. System Operations will be responsible for overseeing coordination of FPC's entire operations and soliciting optimal performance. The Facilities Utilization group will handle corporate policy on permitting, contracts, and impact issues. Finally, the Distribution Standards people will set construction standards and provide engineering expertise.

**FLORIDA POWER CORPORATION
1999 ENERGY DELIVERY
ORGANIZATIONAL CHART**

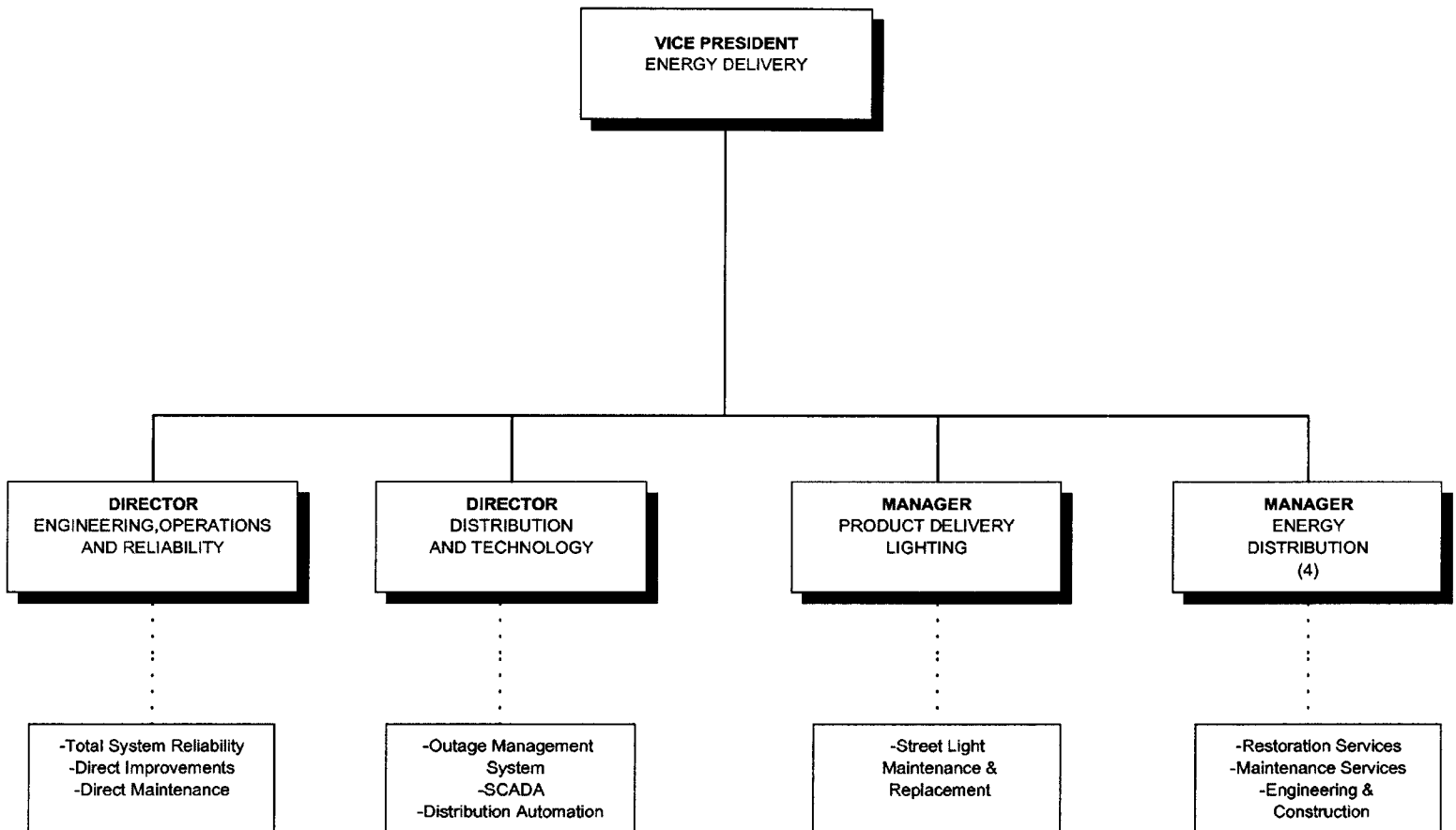


EXHIBIT FPC-11

*Source: FPC Response to Document
Request 1-3*

**FLORIDA POWER CORPORATION
RELIABILITY AND OPERATIONS
1999 ORGANIZATIONAL CHART**

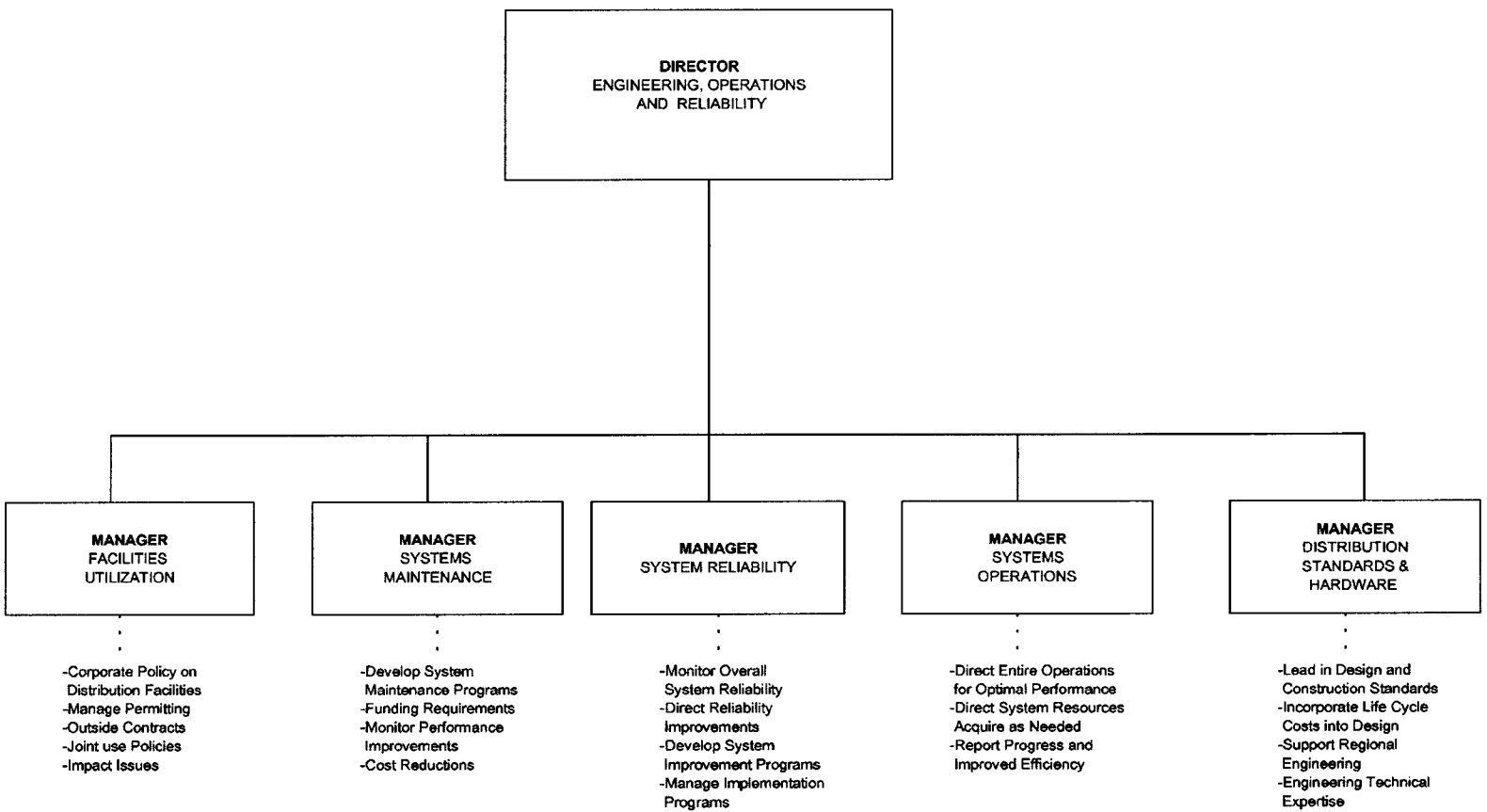


EXHIBIT FPC-12

Source: FPC Response to Document Request 1-3

4.5.2 Maintenance Planning

An important issue is the attention utilities are presently giving to preventive maintenance of their distribution facilities. In preparation for competition, utilities are tempted to reduce operations and maintenance (O&M) expenditures on their facilities in order to remain cost-competitive. However, in an era of competition, utilities must balance maintaining levels of service reliability with the need to keep costs down.

As shown in **Exhibit FPC-13**, FPC's total O&M expenses with and without fuel increased from 1995 to 1997. However, 1998 expenses, excluding fuel, showed a decline. Most of these expense reductions appear to have occurred in operations other than distribution. **Exhibit FPC-14** depicts the company's distribution portion of total O&M over the same period and budgeted figures through 2001. Expense allocations remained roughly constant until 1997 when the budget was increased by \$7.4 million. It was increased again in 1998 by \$5.8 million. For the years 1999 through 2001, FPC anticipates increased expenses to maintain its distribution system.

With the 1997 creation of the System Maintenance group under the new Director of Engineering, Operations and Reliability, the company decided it would become less reactive and more proactive in maintaining its distribution network.

FPC realized that immediate benefits need to be achieved by strengthening specific maintenance functions. Various operations have been in place and are being scheduled, tracked, and coordinated. These activities include tree trimming, plant and equipment inspections, feeder devices,

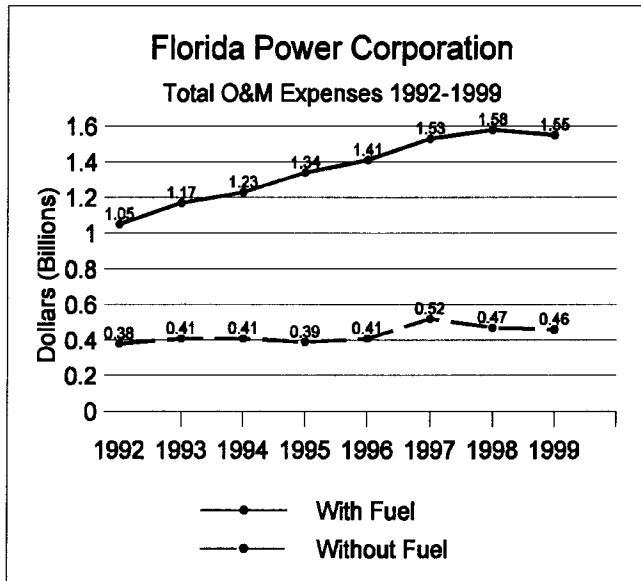


EXHIBIT FPC-13

Source: DR 2-6 & 3-1.

*1997 expense includes \$100 million from non-recurring CR3 outage costs.

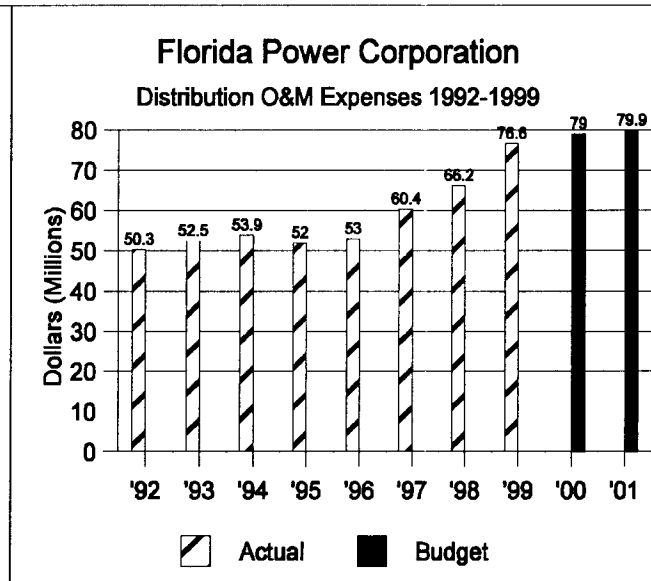


EXHIBIT FPC-14

Source: DR 1-9 & 1-22.

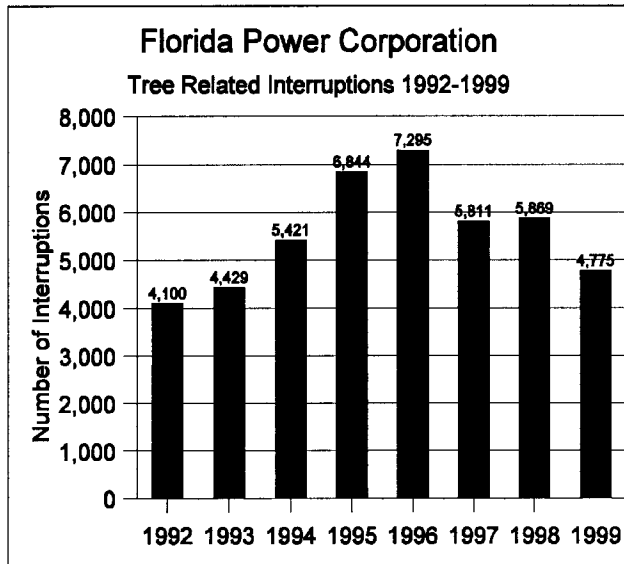


EXHIBIT FPC-15 *Source: FPC Service Reliability Reports 1993-1998 & DR 2-16.*

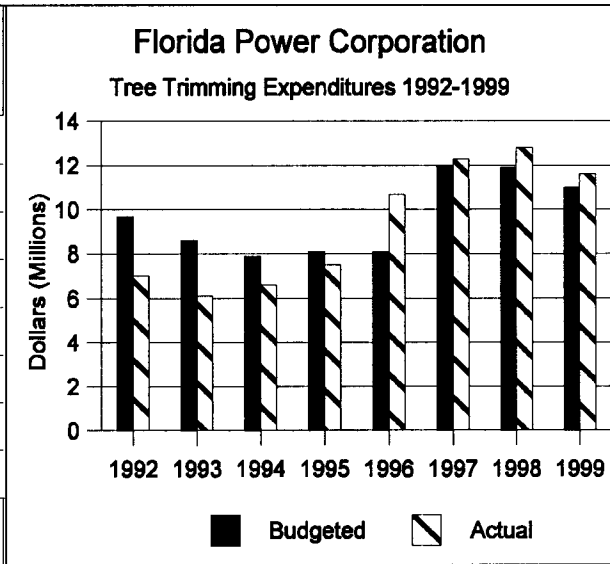


EXHIBIT FPC-16 *Source: FPC Response to DR 1-22.*

substation maintenance, restoration/repair services and are discussed further in Sections 4.5.3 through 4.5.6.

4.5.3 Tree Trimming

Exhibit FPC-15 depicts the number of tree-related interruptions from 1992 through 1999. **Exhibit FPC-16** portrays FPC's corresponding budgeted and actual tree-trimming expenditures for the period of 1992 to 1999. A comparison shows FPC's reduction in funds from \$9.7 million in 1992 to \$8.1 million in 1996, resulting in a 78 percent increase in tree-related interruptions over the same period. The company had actual expenditures in 1998 of \$12.8 million, which is an increase of 16.5 percent over 1996 expenditures. For 1999, the expenditures total over 11 million. Since instituting the three-year trim cycle in 1996, tree-related interruptions have been reduced by 35 percent.

The new trim cycle, which began in September of 1999, should benefit from cost savings. FPC's tree-trimming contractor had established a prior three-year cycle, thus the ensuing three years should be cheaper to maintain. Therefore, as Exhibit FPC-16 shows, budgeted monies were reduced for 1999.

4.5.4 Substation Maintenance

Another vital facet of service reliability is the maintenance of substations. The key to proper monitoring of substations is to embark on a program of proactive or predictive maintenance, while holding down costs and improving service reliability at the same time.

Exhibit FPC-17 reflects FPC's total substation maintenance expenditures for each of the years 1992 through 1998 and budgeted for 1999. The exhibit separates total costs associated with

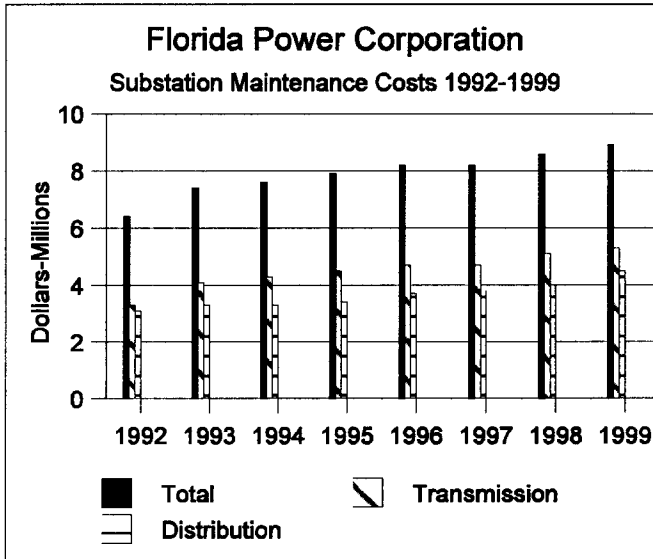


EXHIBIT FPC-17

Source: FPC Response to Document Request 1-20.

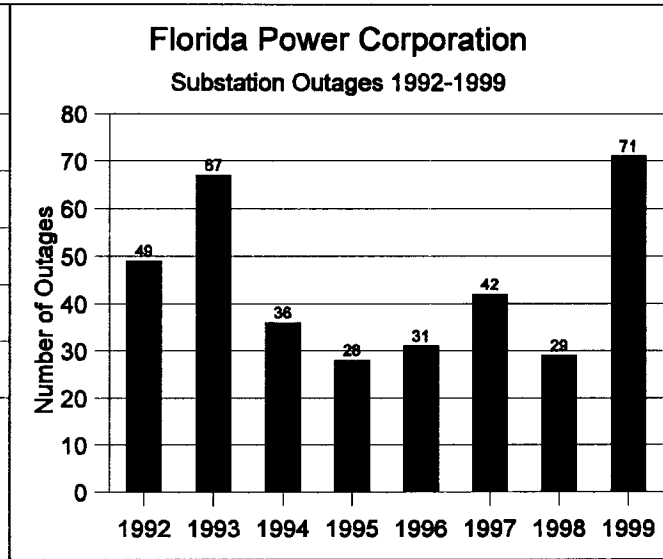


EXHIBIT FPC-18

Source: FPC Response to Document Requests 1-41 & 2-4.

transmission and distribution substation maintenance in accordance with FERC Accounts 570 and 592. The accounts include the cost of labor, materials used, and expenses incurred in maintaining the stations.

From 1992 to 1998, total costs have increased 40 percent from \$6.4 million to a \$10 million budget for 1999. The increase in costs was primarily attributed to higher labor, transportation, and material costs (averaging about five percent annually). Additionally, FPC has added twenty-nine new substations since 1996, which has increased total maintenance expenses over time.

Exhibit FPC-18 reflects the number of substation outages over the period of 1992 through 1999 that resulted in customer interruptions. **Exhibit FPC-19** further breaks down these outages geographically by FPC's three regions. As shown on Exhibit FPC-18, the largest number of substation outages experienced (71) occurred in 1999, with an even split occurring in all regions. Since 1993, the total number of outages has remained fairly consistent. Results for 1999 indicate an escalation that FPC attributes to breaker malfunctions and increased animal and lightning activities. FPC is working on root-cause analysis regarding these occurrences and is taking preventive measures to curtail the problems.

As previously mentioned, maintenance of both FPC's transmission and distribution substations falls under the responsibility of the company's Bulk Power organization. According to FPC's Substation Inspection procedures, all of the distribution substations are inspected each month, including examination of transformers, circuit breakers, regulators, power fuses, insulators, switches, oil/gas leaks and perimeter security. The monthly inspection data is fed into a new Windows-based system called CASCADE, which replaced the outdated substation maintenance system. CASCADE is a highly-flexible, reliability-centered, maintenance planning system that can

be used for transmission and substation. It can interface with corporate systems, as well as originate labor and material cost sheets.

4.5.5 Plant/Equipment Inspection

Additional preventive maintenance programs have been accelerated as a result of FPC's restructuring and focus on improving service reliability. The company's efforts in pole maintenance, lightning protection, underground cable, and feeder inspection are each discussed separately below.

Pole Maintenance

In 1996, FPC launched a pole maintenance program that involved re-inspection of the company's older poles. By the end of 1998, FPC had spent over \$11 million on the inspection, repair or replacement of poles since starting this program. The inspection is carried out by Osmose. Osmose is the contractor that inspects and injects poles in need of treatment and also braces the poles, when necessary, to extend their life. Poles in need of complete replacement are handled by FPC. The first cycle has been completed, and FPC reports all poles in the system have been inspected. To date, FPC has inspected 155,645 poles, replaced 9,562, and braced 10,366. The 1999 budget has scheduled \$1.87 million to complete bracing and replacement before the second inspection cycle is started.

Lightning Protection

Exhibit FPC-2 showed that lightning interruptions declined in 1997 versus 1999 interruptions by 19 percent. This is an indication that FPC's ongoing program has been beneficial. With continued efforts to combat lightning-related outages, FPC committed to increased transformer protection. FPC began installing "under oil arresters" (arrester is located inside transformer) rather than using pole lightning arresters. As of October 1996, all installations of new padmount transformers were equipped with under-oil arresters, which significantly improves underground protection.

Underground Cable

Starting in 1996, FPC undertook an extensive review of its underground cable replacement procedures. It examined the cost effectiveness of underground cable as well as the root cause of cable failures. Results of the review determined that it would be more feasible to evaluate alternative methods of restoring cable as opposed to replacing it. As a result, FPC instituted two cable restoration pilot programs of cable injection and increased lightning protection. FPC's total allocation costs for both programs was \$2.3 million in 1997, \$2.3 million in 1998, and \$3.4 million in 1999.

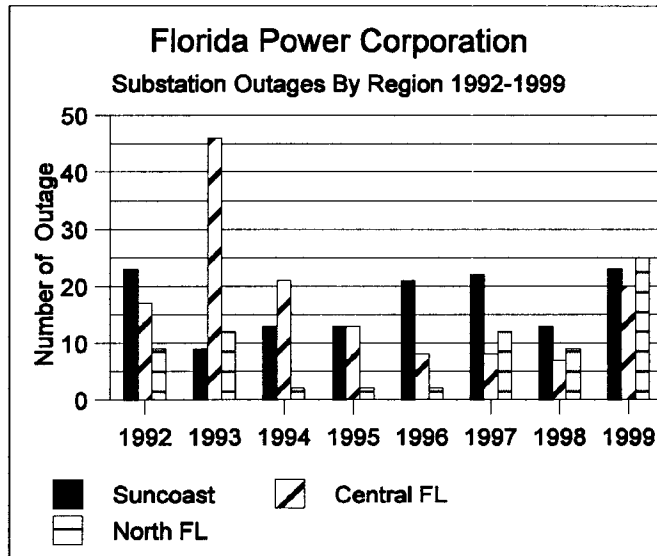


EXHIBIT FPC-19

Source: FPC Response to Document Request 1-41.

Feeder Inspection

As noted in Section 4.3.2, FPC had previously identified its worst-performing feeders and launched a program called Selective Corrective Reliability Enhancements or “SCORE” in 1997. Its primary focus is to add lightning protection, add field circuit breakers, and identify/replace other defective equipment. In 1997, FPC expended \$1.2 million. In 1998, an additional \$2.5 million was expended. The 1999 budget allocated \$11.6 million for feeder system reliability.

Through 1999, FPC had three feeders that are identified as the worst performing: Feeders W-174, A-2, and A-35. Examples of work completed on feeder W-174 show three new reclosers for \$63,000, new fusing configuration at \$22,000, tree trimming of 9.27 miles, and various other upgrades at \$25,000. Feeder A-2 received new fusing at \$5,400 and 6.40 miles of tree trimming. FPC reports these two feeders have dropped off the worst-performing list. Further information on Feeder A-35 reports new reclosers at \$30,000, new fusing at \$9,000, 7.14 miles of tree trimming, and other work at \$2,100. However, FPC reports this feeder is still having multiple outages and additional work is in progress.

4.5.6 Restoration and Repair

As previously reported, FPC’s restoration and repair services are carried out at each of the operating levels and in consolidated area operations. It should be noted that FPC is currently reassessing its consolidation of its operating centers, and the resultant impact on reliability primarily focuses on its Northern Region.

Exhibit FPC-20 shows staffing levels of FPC’s bargaining unit employees, sorted by regions, over the period of 1993 through June 1999. The net result is the rehiring of 72 positions over the three-year period since 1996. FPC has set its bargaining unit workforce at 1,136, or just below its 1,140 employees in year 1992.

Florida Power Corporation Bargaining Unit Staffing Levels 1993-1999 7 Year Historical and Percent Change								
Region	1993	1994	1995	1996	1997	1998	1999	Percent Change 1993-1999
Suncoast	374	369	347	361	372	369	377	.8%
North Florida	205	195	180	177	187	193	205	0
Central Florida	561	538	517	526	538	537	554	-1.2%
Total	1140	1102	1044	1064	1097	1099	1136	-.4%

EXHIBIT FPC-20

Source: FPC Response to Document Requests 1-14 & 2-4.

Due to concerns about declining levels of service, FPC created a “virtual” call center by consolidating its call answering functions from four regional locations into two fully-linked call centers in 1996. Improvements were made to the telephone network that included a new 800 number and an increased number of lines for all of FPC’s northern area customers. According to FPC, these improvements allowed more customers to report outages sooner, therefore increasing the calculated average duration of outages reported. The new network provides for emergency backup and rerouting of calls should be a primary line fail. Additionally, FPC implemented several new technologies in the call centers including the Voice Response Unit capabilities described in Section 4.4.1. The Voice Response Unit provides automated services, including reporting of outages.

The trend in FPC’s distribution vehicles supporting these field forces, is reflected in **Exhibit FPC-21**. Starting in 1998, FPC increased its total vehicles to 838 and subsequently to 852 in 1999. The data shown includes service (e.g., bucket and construction) trucks and vehicles used by line crews, foremen, meter readers and reconnect and disconnect personnel. From 1992 through 1997, the total number of vehicles was reduced ten percent, from 908 to 817. Over the eight-year period shown, total vehicles have returned to 1994’s equivalent service level. In addition, **Exhibit FPC-22** reflects the distribution of vehicles by region. As noted for 1999, more vehicles were reapportioned according to need and allocations are at a seven-year high in each region.

FPC’s service restoration process is highlighted in **Exhibit FPC-23** and reflects no change since the 1997 report. The process begins when a customer reports an outage to a customer service representative or by way of the Voice Response Unit. Upon receipt of an outage call, a trouble ticket is automatically printed at one of FPC’s six dispatch centers located closest to the outage. A dispatch operator assigns the trouble ticket to an available troubleman within close proximity of the

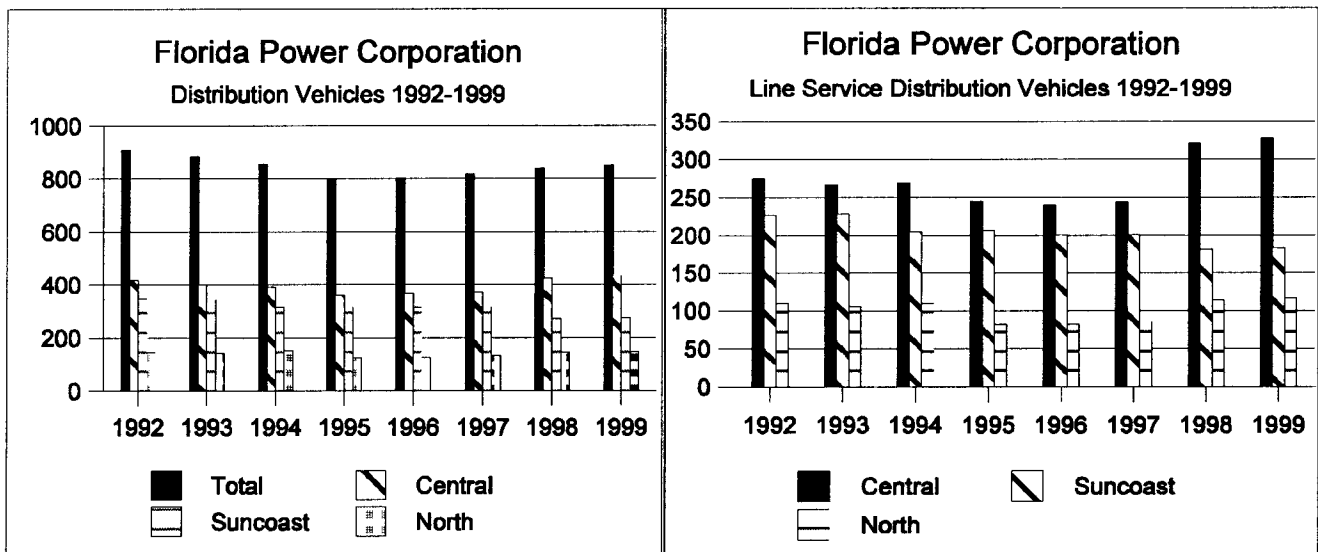


EXHIBIT FPC-21

Source: FPC Response to Document Request 1-15 & 2-4.

EXHIBIT FPC-22

Source: FPC Response to Document Request 2-4.

FLORIDA POWER CORPORATION OUTAGE HANDLING PROCESS 1999

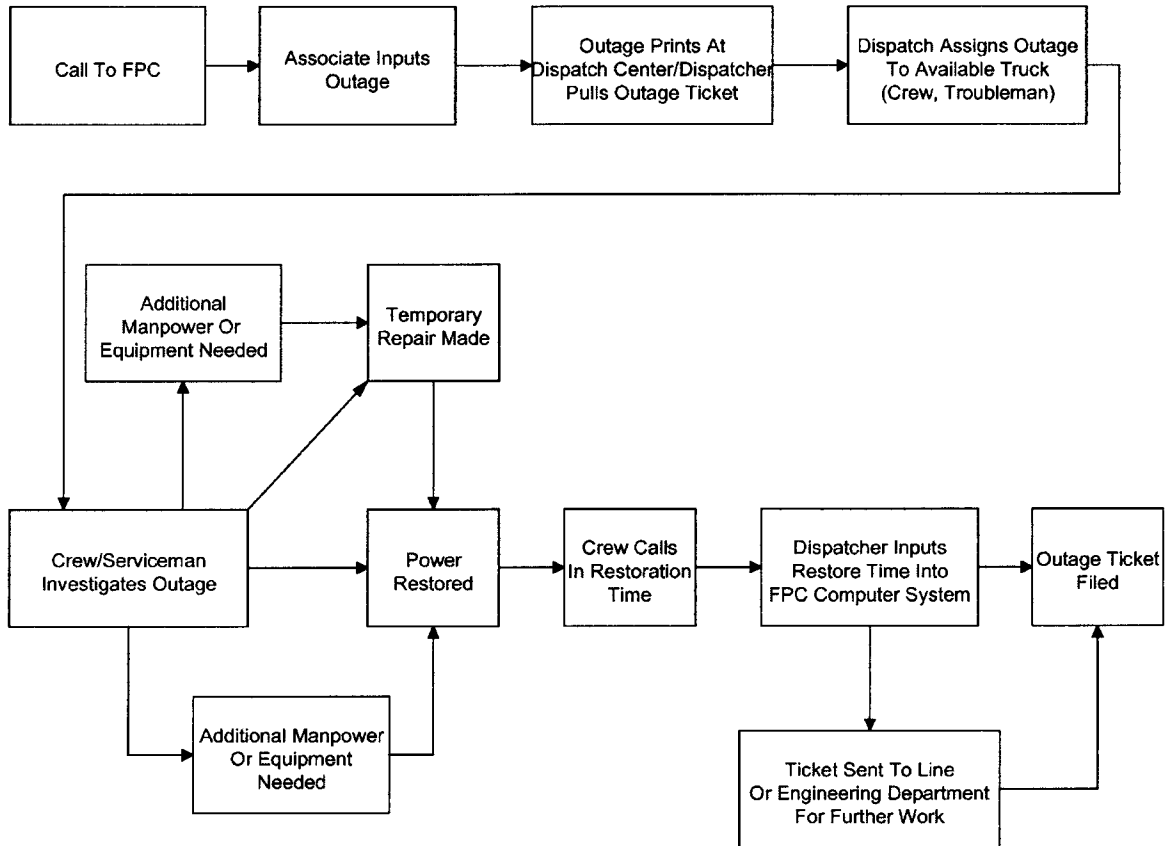


EXHIBIT FPC-23

Source: FPC Response to Document Request 1-16.

call. The process in FPC's Northern Region is slightly different in that a contracted firm monitors the Voice Response Unit outage calls and faxes the trouble tickets to the call center closest to the outage.

FPC's policy requires troublemen to live within 40 minutes of the operating center where they are based. Additionally, troublemen are authorized to bring home company trucks to allow for quicker response times. The first line of defense in the majority of FPC's outage calls is the company's troublemen. During off-shift hours and weekends, the company can dispatch off-duty troublemen and service crews from their homes to assist in the restoration process.

4.6 Recent Trends and Changes

The most recent development for FPC is the potential acquisition by Carolina Power & Light. The latest news regarding the merger is the anticipated reduction of 1200-1500 employees and a current hiring freeze. At this time, it is not known whether the merger will be granted approval by the various governmental agencies, nor what long-term effect it will have on operations.

Current reliability indicators reflect sustained improvement in most instances. A summary of 1997 versus 1999 is shown in the following table:

Improvements made during 1999 include the following:

- ◆ Total interruptions have dropped 6 percent.
- ◆ SAIDI has decreased by 33.42 minutes (from 130.4 to 97 minutes).
- ◆ CAIDI has stabilized to 1996 levels.
- ◆ SAIFI frequency has decreased by .46 occurrences (from 1.81 to 1.35 occurrences).
- ◆ Multiple interruptions (5 or more) have dropped from 5.2 percent to 3.9 percent.

Indicators reflecting degradation:

- ◆ Average length of an interruption (L-Bar) went up 4 minutes.
- ◆ For 1999, substation outages have increased.

Additionally, Exhibit FPC-24 demonstrates projects started in late 1996 and the current status.

4.7 Conclusions

Beginning in 1996, FPC took extensive actions to reverse a decline in system distribution reliability decline. These actions have included management changes, restructuring in the company's Energy Delivery Business Unit, identification and assessment of weaknesses, and actions to improve plant reliability. As Exhibits FPC-24 and FPC-25 indicate, many new programs implemented by FPC are improving reliability and may lead to further improvement in future years. Additionally, it should be noted that distribution expenses have risen and budgeted monies are even higher for the future.

Project Status	Florida Power Corporation Pre-1998 Planned Actions Taken to Improve Reliability 1998 Progress Report
In Place	<ul style="list-style-type: none"> ■ Improved the response availability of line department personnel by setting and enforcing higher call out expectations.
In Place	<ul style="list-style-type: none"> ■ Assured the maximum number of employees is available during the storm season by scheduling line crews on five eight-hour days rather than four ten-hour days, and scheduling the latest hours practical within the contractual guidelines.
On Going	<ul style="list-style-type: none"> ■ Delegated the decision to call for additional resources from other regions or work centers to the construction and operation managers and first line supervisors.
In Place	<ul style="list-style-type: none"> ■ Reemphasized the practice of calling operations engineers at the onset of storms to assist in restoration activity.
In Place	<ul style="list-style-type: none"> ■ Began to utilize available personnel for material hauling during storm situations (i.e., substation, meter readers, R&D, stores).
In Place	<ul style="list-style-type: none"> ■ Initiated management meetings with all supervisors and employees to emphasize the need for efficient and timely restoration of outages.
On Going	<ul style="list-style-type: none"> ■ Assured the timely repair of underground residential distribution primary cables to prevent extended outages arising from loop feeds left on a radial feed.
Continuing	<ul style="list-style-type: none"> ■ Added contract resources to the existing workforce during storm months.
Complete	<ul style="list-style-type: none"> ■ Patrolled and repaired 50 of the worst-performing circuits system wide.
Suspended	<ul style="list-style-type: none"> ■ Implementing a system-wide program to patrol all feeders not planned to be trimmed until 1998 and 1999, and clear identified problems likely to cause large outages.
Complete	<ul style="list-style-type: none"> ■ Adding two Senior Engineering Representatives to monitor, investigate and correct reliability problems.
Still in Progress	<ul style="list-style-type: none"> ■ Replacing lightly loaded three phase reclosers with hydraulic single phase units.
Complete	<ul style="list-style-type: none"> ■ Replacing heavily loaded three phase reclosers with electronically controlled single phase units.
In Place	<ul style="list-style-type: none"> ■ Adding shift supervisors in dispatch centers to assure appropriate management of restoration activities, performance of personnel, and reduction of long duration outages.
Complete	<ul style="list-style-type: none"> ■ Adding fault indication on selected circuits to speed restoration efforts.
Suspended	<ul style="list-style-type: none"> ■ Piloting an automated detection system-wide called Outage Sentry.

EXHIBIT FPC-24

Source: FPC (1997) Document Request 2-12.

Florida Power Corporation 1996-1999 Planned and Continued Actions Taken to Improve Reliability	Total Monetary Allocation (in Millions)		
	1997	1998	1999
■ Improved the response availability of line department personnel by setting and enforcing higher call out expectations. Call out is up 7% over 1996.	N/A	In Place	In Place
■ Assure the maximum number of employees are available during the storm season by scheduling line crews on five eight-hour days rather than four ten-hour days. Each service center is scheduling late crews each work day.	N/A	In Place	In Place
■ Quick response crews available to travel. Supervision can dispatch resources as needed.	N/A	In Place	In Place
■ Management meetings are held to discuss reliability. Reports are sent to managers on a monthly basis. System wide meetings are held by the VP of Energy Distribution.	N/A	In Place	In Place
■ Tree trimming, as noted in Section 4.5.3.	\$12.3	\$12.7	\$12.6
■ Pole inspection, as noted in Section 4.5.5.	\$4.9	\$6.1	\$1.8
■ Upgrade SCADA control for 237 feeders beginning in 1997.	\$1.1	\$1.0	N/A
■ SCORE as noted in Section 4.5.5.	\$1.2	\$2.5	\$11.6
■ Delivery 2000 Technology Plan designed to upgrade many of FPC's computer systems which will improve reliability.	N/A	\$5.0	\$12.0
■ New technology pilots on line reclosers designed to reduce customer outages, using faulted circuit indicators	N/A	\$.49	\$.1
■ Reliability engineers are identifying devices in a program called System Exceptions.	\$1.1	\$2.58	\$3.6
■ Underground cable replacement and injection as noted in Section 4.5.5.	\$2.3	\$2.3	\$3.46
■ Recloser replacement beginning in 1998 with new electronic devices being installed. Replacing lightly loaded three phase reclosers with hydraulic single phase units.	N/A	\$.465	N/A
■Totals by Year	\$22.9	\$33.1	\$46.06

EXHIBIT FPC-25

Source: FPC Response to Document Request 1-23 & 2-18.

FPC's distribution reliability and service quality indicators, as measured by both the FPSC and the company, had declined notably over the study period of 1992 through 1996. Conversely, there has been improvement that started in 1997 and has progressed through year-end 1999. SAIDI, which measures the average duration of an outage, has improved. CAIDI, which reflects average response time, has also improved in 1999, as well as SAIFI, which measures the frequency of the outages. The conclusion is that FPC customers are experiencing shorter outages, fewer outages, and the response time is quicker. In contrast, FASTRACK's Energy Delivery indicator only rose by one percentage point, which may indicate that customers are still not satisfied with reliability.

At year-end 1999, there are indications that FPC has new programs that still need time to show results. Some pre-existing problems are still present. Overall, an average FPC distribution customer has improved distribution system reliability. With future monitoring by way of the Commission's reliability reports, progress can continue to be observed and documented by staff.

As voluntary reporting of the current expanded service quality measures is coming to a close, it is important that their effectiveness be measured, and new measurements be established with the aide and cooperation of Florida's electric utilities. As noted in section 3.6, Florida electric utilities and the Commission are currently studying the best means of measuring reliability in the future by way of a proposal due from each of the companies by November 30, 2000. At the May 2000 Distribution Reliability Report meeting, staff asked for each utilities' proposal to provide two items of information:

1. Provide a working definition of reliable and adequate electric service, and
2. Describe the necessary reporting requirements to fit the above definition.