CHAPTER 19
A BUSINESS EXAMPLE OF POLICY MANAGEMENT

Sections

Chapter Objectives

- To present a detailed example of policy management

19.1 A Business Example of Policy Management

Florida Power & Light Company (FPL) is the largest utility furnishing the generation, transmission, distribution, and sale of electricity in the state of Florida. From its inception in 1925, FPL has experienced steady growth. In November 1989, Florida Power & Light Company achieved international recognition when its employees challenged for, and won, the prestigious **Deming Prize** for quality. The Deming Prize is awarded annually by the Japanese Union of Scientists and Engineers (JUSE) to companies that excel in the practice of the Japanese method of quality management, called Japanese Total Quality Control. FPL was the first non Japanese company to win the Deming Prize [Gitlow and Loredo, 1992-1993, pp. 123-158].

19.1.1 Reasons for the Quality Improvement Program (QIP) at FP&L

By the early 1980s, FPL was facing a hostile environment created largely by high inflation, decreasing customer sales, rising electric rates, and increasing fuel oil prices. The price of electricity was increasing faster than the Consumer Price Index (CPI). At the same time, competitive market pressures were beginning to affect FPL's long-term prospects. Customer dissatisfaction grew as FPL failed to meet increasing expectations for reliability, safety, and customer service. In the meantime, FPL's inability to react quickly to new environmental demands added to their plight.

19.1.2 Objectives of the Quality Improvement Program at FP&L

It was clear to FPL's leadership that their existing managerial structures were not keeping pace with FPL's rapidly changing internal and external environments. Above all, they recognized that FPL was facing four significant crises which warranted a complete restructuring of their managerial systems.

Crisis 1: Fast changing internal and external environments
Crisis 2: Declining customer confidence and satisfaction
Crisis 3: Uncertainty of the future of nuclear power supply
Crisis 4: Price of electricity increasing faster than the Consumer Price Index.

As described by FPL's top executives, crisis 1 was an internal issue which involved changing FPL's corporate culture. FPL had to change its mode of thinking from a supply-oriented mindset to a customer-oriented mindset; from a power generation company to a customer service company. To accomplish this, FPL's managers needed a process that would allow them to identify and address the key issues surrounding customer satisfaction.

Crises 2, 3, and 4 were related to external issues. FPL's leadership realized that these issues required systematic and resourceful management, guided by a vision, a mission, and strong strategic and business plans.

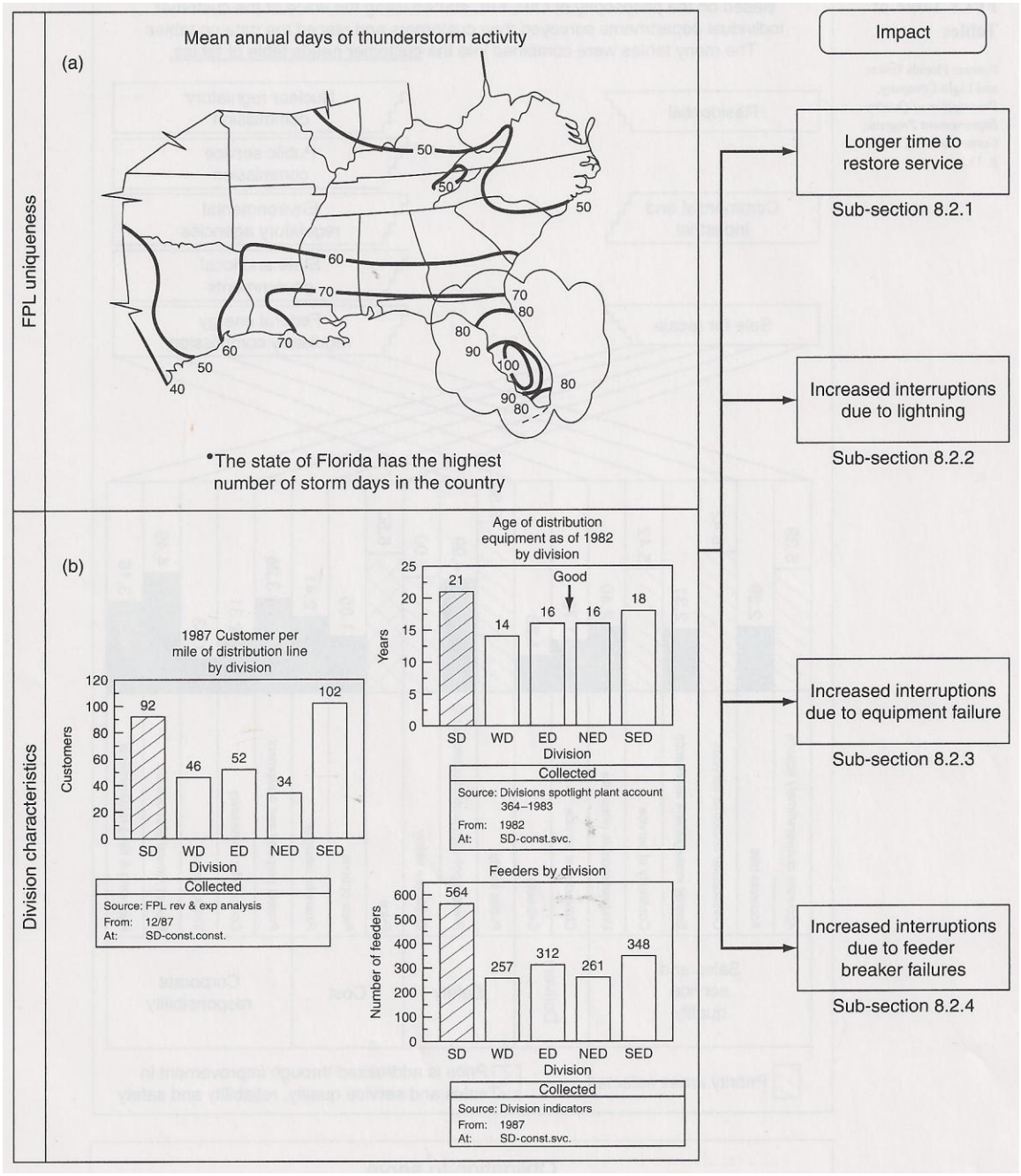
The first step toward resolving these crises was the installation of a new management system. Prior to 1985, **management by objectives** (MBO) had been FPL's principal policy for setting and achieving corporate goals. However, company top management had concluded that MBO was not capable of resolving the issues at the core of the four crises with which the company was to grapple. In particular, MBO's focus on the company's point of view rather than on the customer's needs conflicted with the establishment of a new corporate culture and consequently, with the resolution of crisis 1. Also, MBO did not provide a systematic method for measuring and achieving corporate objectives. A system was needed that would be responsive to changes in FPL's operating environment, as well as to the needs of their customers. To this end, FPL established its Quality Improvement Program (QIP).

19.1.3 Reacting to the Crises

*Determining Customer Needs***.** To a great extent, the success of FPL's new management process, QIP, would depend on the development and application of a tool that could systematically identify and prioritize the needs of FPL's customers. FPL's diverse customer base is composed of direct customers (residential, commercial, and industrial users) and indirect customers (regulatory and governmental agencies, such as the Nuclear Regulatory Commission, the Florida Public Service Commission, Environmental and Regulatory Agencies, State and Local Governments, and the Federal Energy Regulatory Commission).

The tool FPL developed to understand the Voice of the Customer for each of its market segments is the Table of Tables, as shown in Figure 19.1. It is used to build customer needs into FPL processes. The Table of Tables shows the prioritized concerns of FPL's diverse customer segments with regard to "sales and service quality," "delivery," "safety," "cost," and "corporate responsibility." By applying the Table of Tables, FPL was able to develop strategies to resolve its four crises.

Figure 19.1
FP&L's Table of Tables



Source: Florida Power and Light Co., *Description of Quality Improvement Program, Southern Division, 1988, p.2, and* Corporate Unit, 1988, p.11

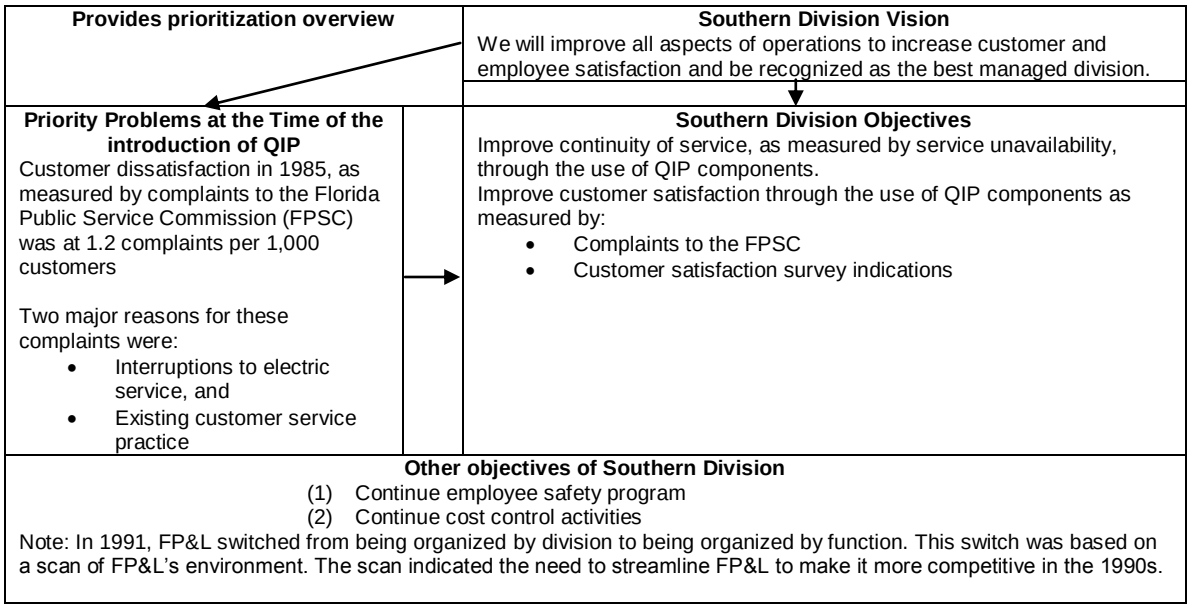
To counter this situation, FPL management modified their Quality Improvement Program (QIP) to include policy management. Policy management coordinated all of the divisions' visions, missions, strategic plans, and business plans with each other, and with FPL's corporate vision, mission, strategic plan, and business plan. For example, the Southern Division's vision is as follows: *"We will improve all aspects of operations to increase customer satisfaction and be recognized as the best*

managed division." In the opinions of the authors, this vision seems to stimulate competition between divisions and would violate Deming's concept of optimizing the system of interdependent stakeholders. However, at the time FPL was following Japanese Total Quality Control, not Deming's theory of management.

The Southern Division's vision is supported by two key objectives; they are (1) improve continuity of service as measured by "service unavailability" through the use of the QIP components, and (2) improve customer satisfaction through the use of the QIP components as measured by "complaints to the Florida Public Service Commission" and "customer satisfaction survey indicators."

The Southern Division's objectives were derived from an examination of "priority problems at the time FPL management introduced QIP" and the "Southern Division's vision, shown in Figure 19.3. The "priority problems at the time FPL management introduced QIP" resulted from the four crises which shaped FPL's corporate vision, mission, strategic plan, and each division's vision. Likewise all other divisions' vision and key objectives reflect corporate policy.

Figure 19.3
FPL Southern Division Vision and Objectives



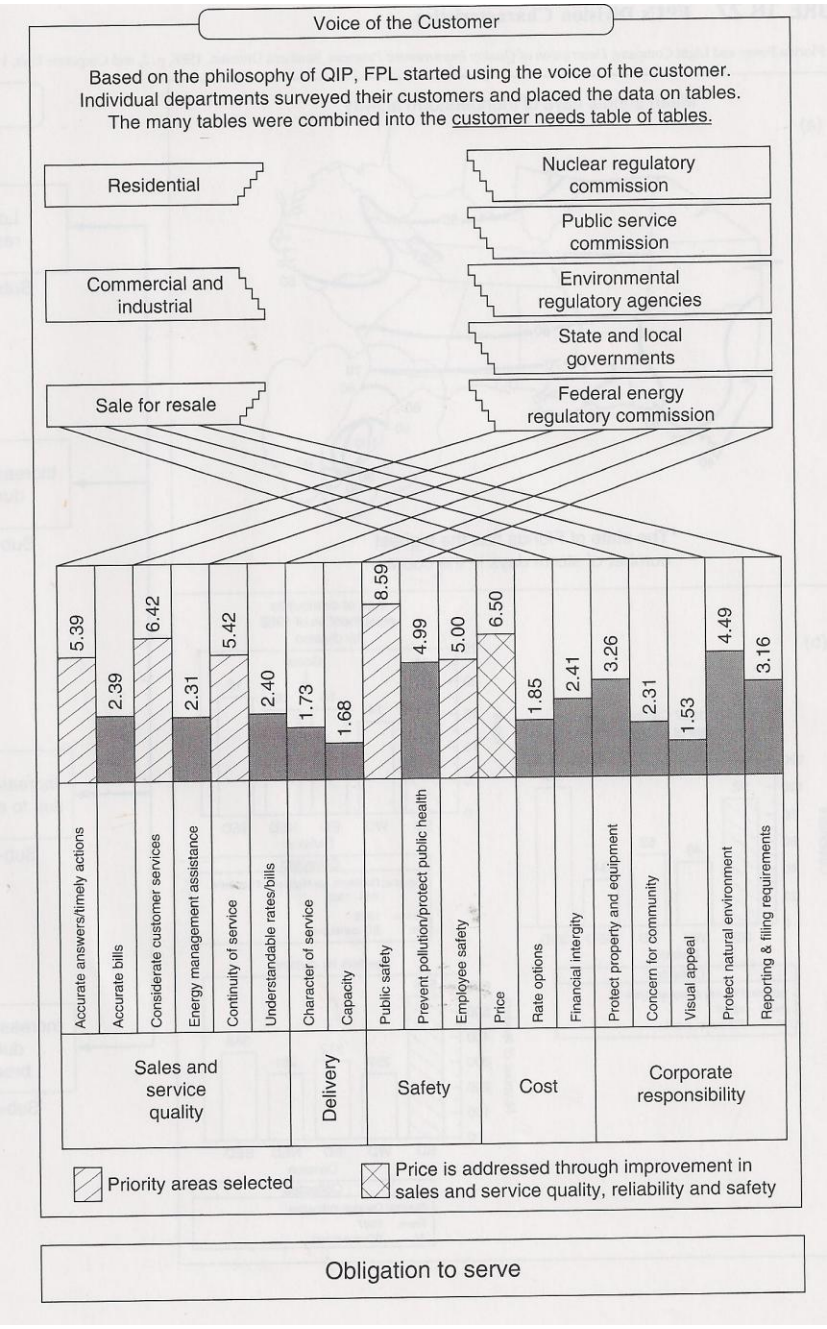
Corporate policies are established by the Executive Committee with the help of the Table of Tables and an examination of FPL's business environment. Once set, policies are communicated to each division in the form of strategic plans. In response, each division submits an annual business plan detailing its predicted contribution toward the realization of the corporate strategic plan.

For example, the Table of Tables representing the Voice of the Customer and "problems at the time of QIP Introduction" were used to guide the development and approval of short-term business plans as follows:

1. The Table of Tables, shown in Figure 19.4(a), prioritized the concerns of FPL's diverse customer base and helped FPL's Executive Committee define the areas that were of greatest importance to customers. As an example, the Table of Tables has a category titled "sales and

service quality," under which fall the following related items: accurate answers/timely actions, accurate bills, considerate customer service, energy management, continuity of service, and understanding rates/bills. All these items were important to FPL's customers. However, of these items, only "accurate answers/timely actions," "considerate customer services," and "continuity of service" were identified by the customers as high priority items.

Figure 19.4(a), (b), and (c)
Business Plan Items



Source: Florida Power and Light Co., *Description of Quality Improvement Program,* Corporate Unit, 1988, p.11

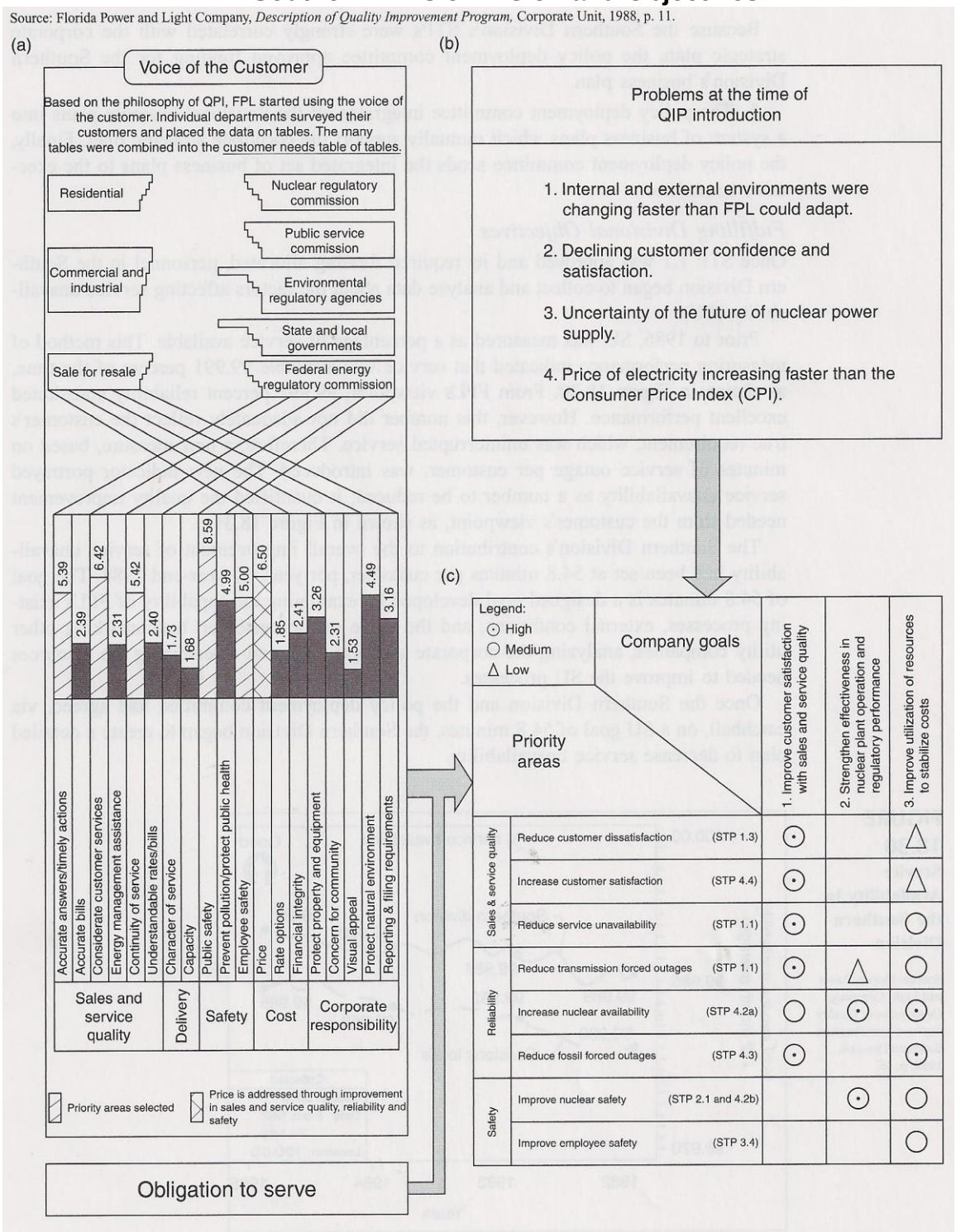
- Crises 2 and 4 were partially resolved by improving sales and service processes which lowered costs and allowed FPL management to decrease the price of electricity.

- Crises 1 and 3 were partially resolved by increasing the level and value of communications between FPL and its operating environment.

The development of the Table of Tables was the key to identifying and prioritizing customer needs and wants. In turn, this information was used to resolve internal and external crises by establishing corporate responsibility (for example, for process improvement action), which was disseminated throughout the organization via policy management.

Establishing Divisional Objectives. Prior to FPL's Quality Improvement Program, each division pursued its own vision and key objectives based on its unique set of characteristics, in Figure 19.2(a), as shown by the differences between divisions in Figure 19.2(b). More often than not, divisional objectives were optimized before corporate objectives. This made it difficult to coordinate divisional objectives within the context of corporate policy and led to interdivisional rivalries and sub-optimization of the corporate whole.

Figure 19.2(a) and (b)
FPL Southern Division Vision and Objectives



2. Corporate priorities were established by the Executive Committee through an examination of the problems FPL was experiencing at the time. The Executive Committee uses the information gathered by end-of-year reviews of internal customers, and an assessment of

FPL's competitive environment to update existing strategic plans, as shown in Figure 19.4(b). These problems then are communicated to each division by the Policy Deployment Committee in the form of updated strategic plans.

3. Each division submits annual business plans, including budgets, to the Policy Deployment Committee. Next, the Policy Deployment Committee reviews the business plans and budgets, and approves those which will have the greatest impact on achievement of the corporate strategic plan.

   All business plan items, called short-term plans, or STP, shown in Figure 19.4(c), and budget items submitted to the Policy Deployment Committee by the Southern Division were evaluated in light of the Voice of the Customer, as shown in Figure 19.4(a) and the "problems at the time of QIP introduction", as shown in Figure 19.4(b).

   In this case, the Southern Division's STP 1.1 [reduce transmission forced outages] addresses: (1) the Voice of the Customer with respect to "sales and service quality" by focusing on "reducing service unavailability," and (2) "problems at the time of QIP introduction" by improving "reliability" as viewed with respect to declining customer confidence and satisfaction and "reducing transmission forced outages." Unfortunately, there is some degree of subjectivity in aligning the Voice of the Customer and "the problems at the time of QIP introduction" with STPs. This process is improved over time using the PDSA cycle.

4. The Policy Deployment Committee examines each of the division's STPs in light of their contribution to the corporate strategic plan, as shown in Figure 19.4(c) for the Southern Division's contribution to the corporate strategic plan). For example, STP 1.1 was highly correlated **(⊙)** with FPL's company goal to "improve customer satisfaction with sales and service quality," was moderately correlated (O) with "improving the "utilization of resources to stabilize costs," and was weakly correlated
   (△) with "strengthening the effectiveness in nuclear plant operations and regulatory performance."

   Because the Southern Division's STPs were strongly correlated with the corporate strategic plan, the Policy Deployment Committee approved funding for the Southern Division's business plan.

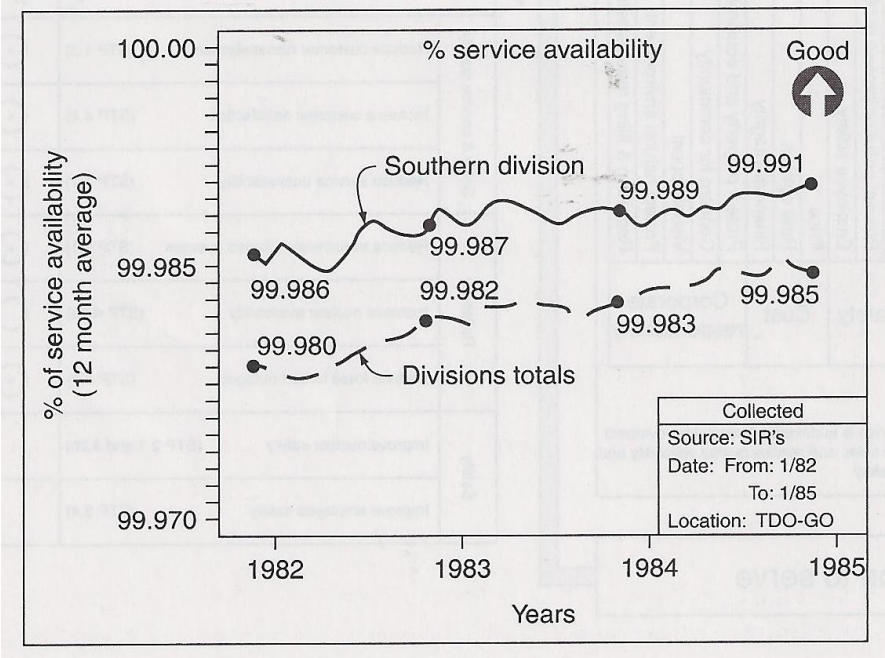
4. The Policy Deployment Committee integrates all the divisions' business plans into a system of business plans which mutually support the corporate strategic plan. Finally, the Policy Deployment Committee sends the integrated set of business plans to the Executive Committee.

*Fulfilling Divisional Objectives***.** Once STP 1.1 was approved and its required funding allocated, personnel in the Southern Division began to collect and analyze data about the factors affecting "Service Unavailability (SU)."

Prior to 1986, SU was measured as a percentage of service available. This method of measuring performance indicated that service was available 99.991 percent of the time, as shown in Figure 19.5. From FPL's viewpoint, 99.991 percent reliability constituted excellent performance. However, this number did not adequately reflect the customer's true requirement, which was uninterrupted service. Therefore, a new measure, based on minutes of service outage per customer, was introduced. The

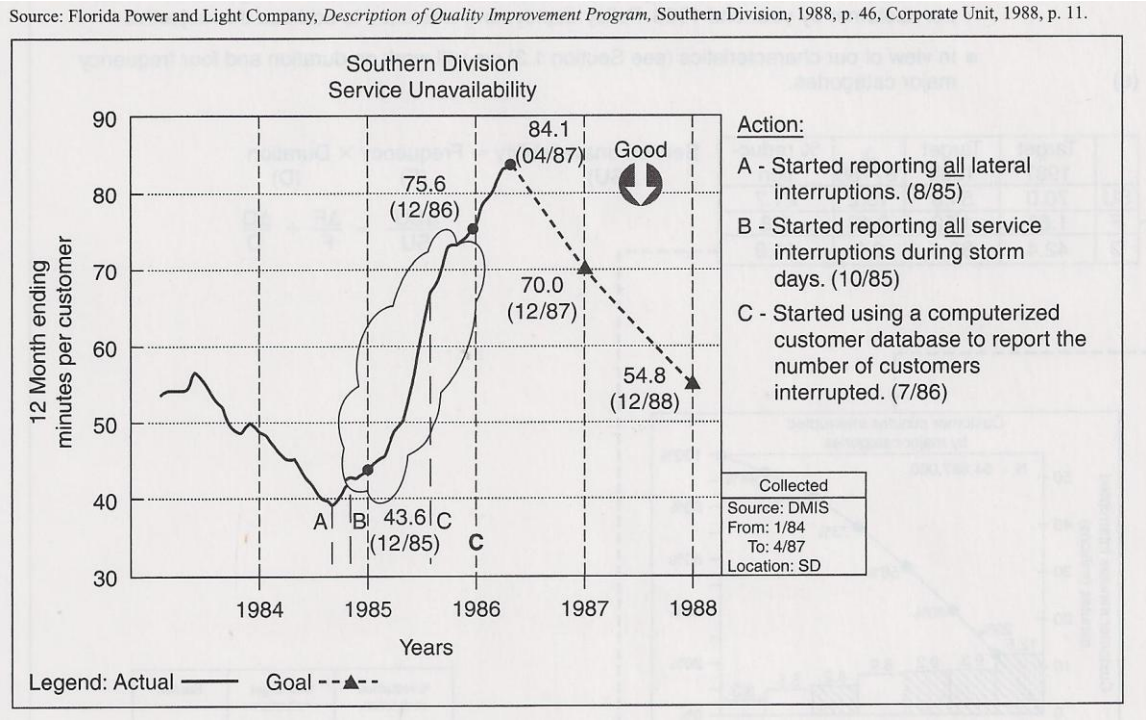
new indicator portrayed Service Unavailability as a number to be reduced; it quantified the quality improvement needed from the customer's viewpoint, as shown in Figure 19.6.

Figure 19.5
Service Availability in the Southern Division



Source: Florida Power and Light Co., *Description of Quality Improvement Program, Southern Division, 1988, p.46.*

19.6
Southern Division Service Unavailability

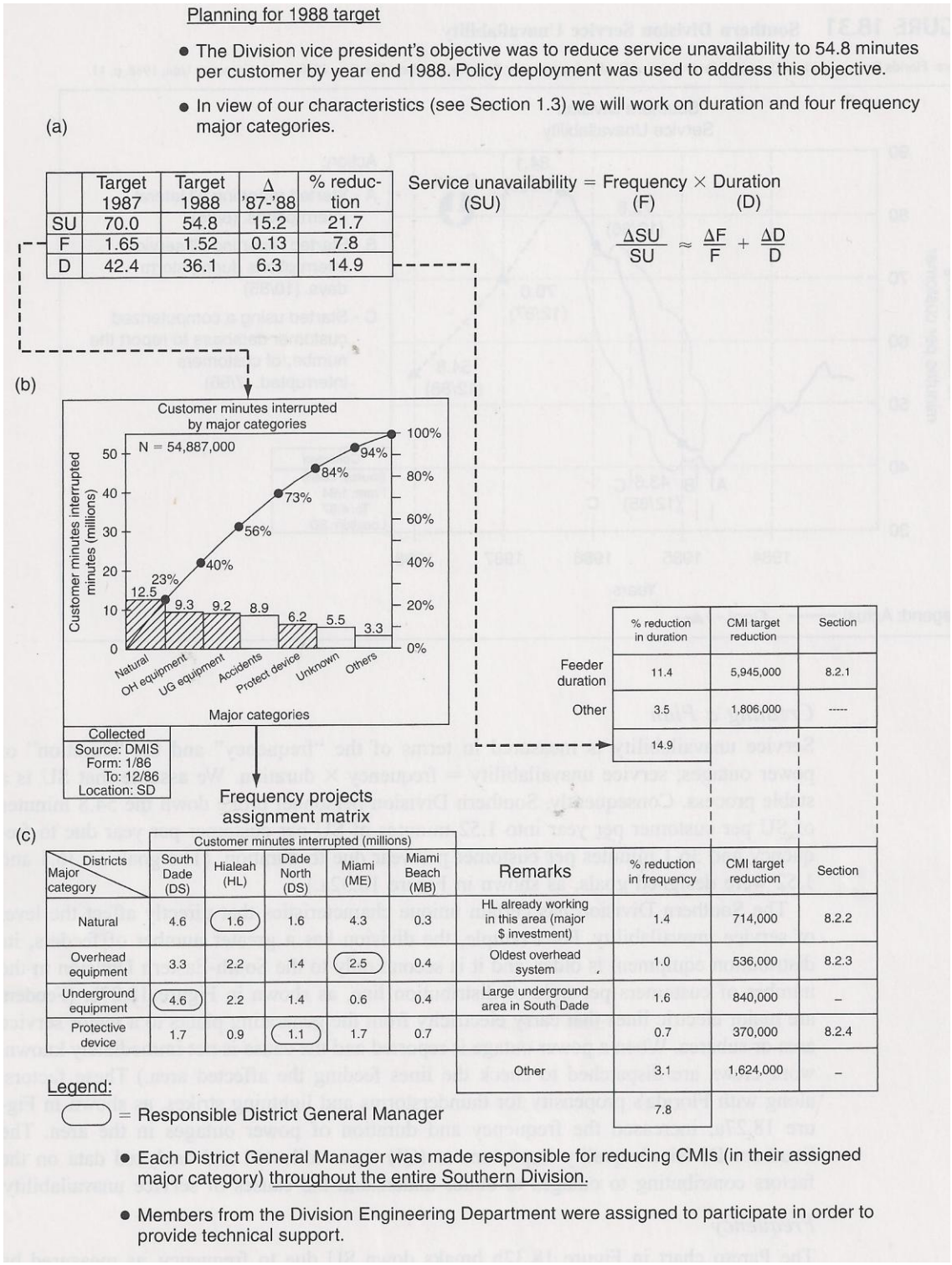


The Southern Division's contribution to the overall improvement of Service Unavailability had been set at 54.8 minutes per customer, per year, by year-end 1988, as shown in Figure 19.6. The goal of 54.8 minutes is a designed goal developed by examining the capability of FPL's existing processes, external conditions, and the Voice of the Customer; benchmarking other utility companies; analyzing the corporate strategic plan; and determining the resources needed to improve the SU processes.

Once the Southern Division and the Policy Deployment Committee had agreed, via catchball, on a SU goal of 54.8 minutes, the Southern Division began to create a detailed plan to decrease service unavailability.

Creating a Plan. Service Unavailability is measured in terms of the "frequency" and the "duration" of power outages: Service Unavailability = Frequency x Duration. We assume that SU is a stable process. Consequently, Southern Division personnel broke down the 54.8 minutes of SU per customer per year into 1.52 minutes of SU per customer per year due to frequency and 36.1 minutes per customer per year due to duration. Note: 36.1x1.52 =54.8. (36.1 and 1.52 were designed goals for the target date of 1988, as shown in Figure 19.7(a).)

Figure 19.7(a), (b). and (c) Assignment Responsibility for Reducing Customer Minutes



Interrupted

The Southern Division has certain unique characteristics that directly affect the level of service unavailability. For example, the division has a greater number of feeders, its distribution equipment is older, and it is second only to the South-Eastern Division in the number of customers per mile of distribution line, as shown in Figure 19.2(b). Feeders are major electric lines that carry electricity from the generating plants to a major service area or subarea. When a power outage is reported and the cause is not immediately known, work crews are dispatched to check the lines feeding the affected area. These factors, along with Florida's propensity for thunderstorms and lightning strikes, as shown in Figure 19.2(a), increased the frequency and duration of power outages in the area. The Southern

Division's Quality Improvement (QI) team collected and analyzed data on the factors contributing to outages to better understand the causes of service unavailability.

Frequency. The Pareto chart in Figure 19.7(b) breaks down SU due to frequency, as measured by Customer Minutes Interrupted (CMI) by major categories. 56 percent of all CMI are due to the top three categories: "Natural," "Overhead Equipment," and "Underground Equipment."

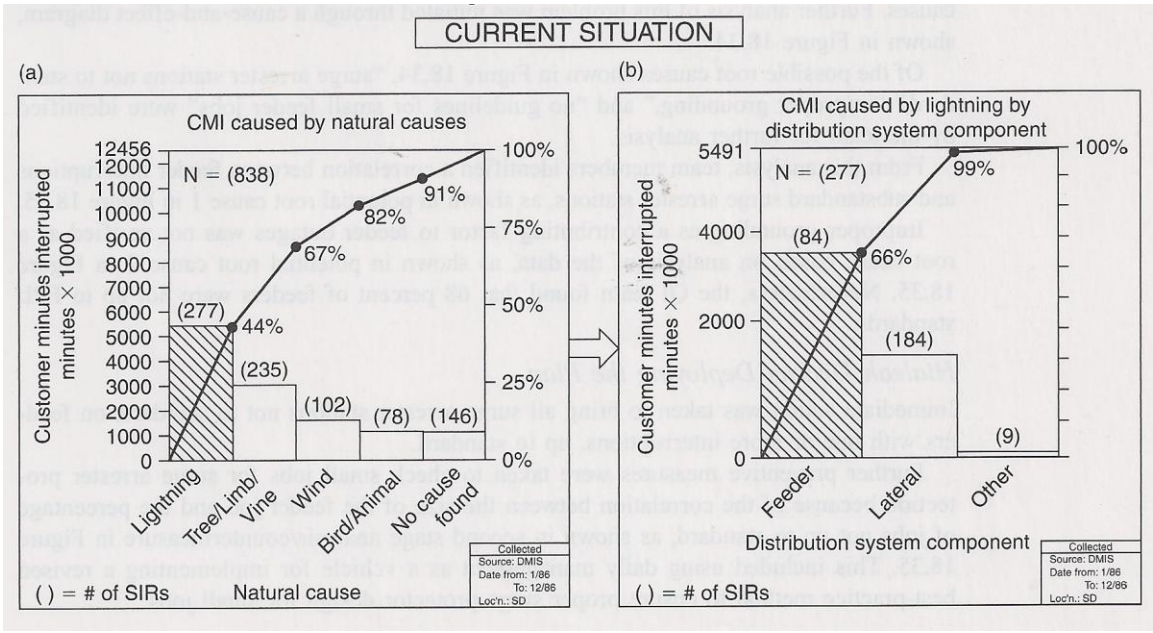
The fourth category, "Accidents," refers in part to outages caused by automobile accidents. Because many of the causes for this factor are not within FPL's control this category was skipped in favor of the fifth category, "Protective Device." Data pertaining to the top three categories and the "Protective Device" category were stratified by district, as shown in the Frequency Projects Assignment Matrix of Figure 19.7(c).

The information incorporated into this matrix was used by the QI team to assign responsibility for reducing Customer Minutes Interrupted (CMI) among the five districts within the Southern Division. For example, although the Hialeah district was not a leader in CMIs due to "Natural" causes, the district was already working on outages due to "Natural" causes and had made a major monetary investment, so they were assigned responsibility to reduce CMI due to "Natural" causes. On the other hand, when assigning responsibility for reductions in CMI due to "underground equipment," the South Dade district's large CMI due to "underground service" made it the obvious choice, as shown in Figure 19.7(c).

Once they were assigned responsibility to eliminate a major category of CMI, each district in the Southern Division organized QI teams to improve relevant standardized methods.

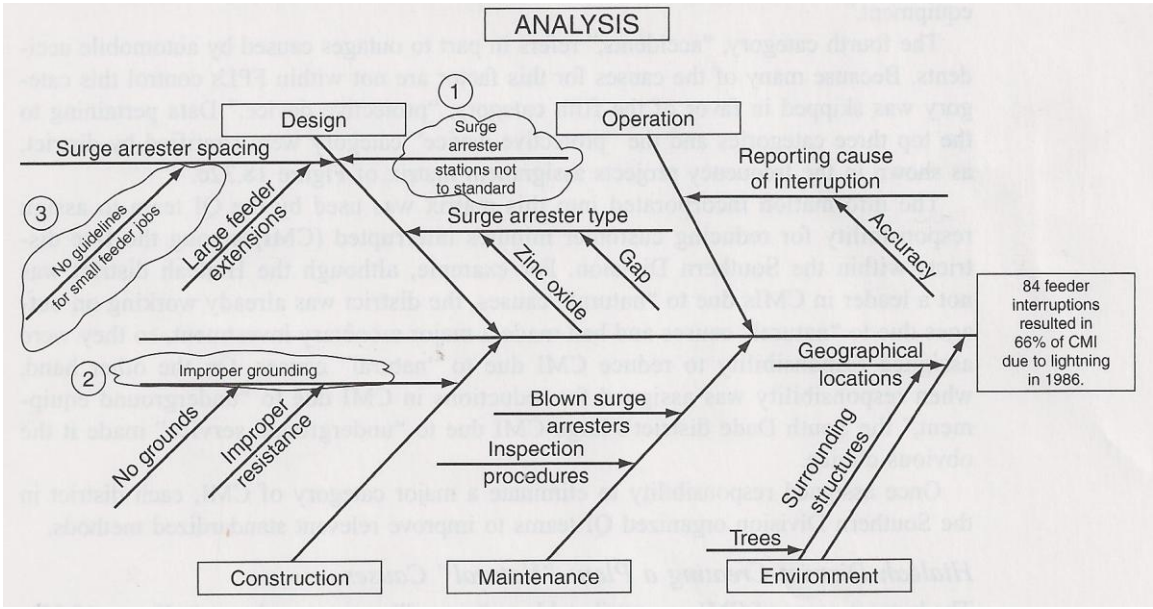
Hialeah District Creating a Plan: "Natural" causes. The biggest cause of CMI was attributable to "Natural" causes, as shown in Figure 19.7(b). Consequently, the Hialeah District's QI team stratified "Natural" causes to gain a better understanding of its root causes, as shown in Figure 19.8(a).

Figure 19.8(a) and (b)
Hialeah District Plan



The Hialeah QI team identified lightning as the most significant factor affecting CMI due to “Natural” causes. Additional CMI data concerning the effects of lightning strikes on the components of the electrical distribution system, such as feeder and lateral, were gathered and displayed on a Pareto chart, shown in Figure 19.8(b). From this, it is clear that lightning damage to feeders accounted for 66% of CMI due to “Natural” causes. Further analysis of this problem was initiated through a cause-and-effect diagram, shown in Figure 19.9.

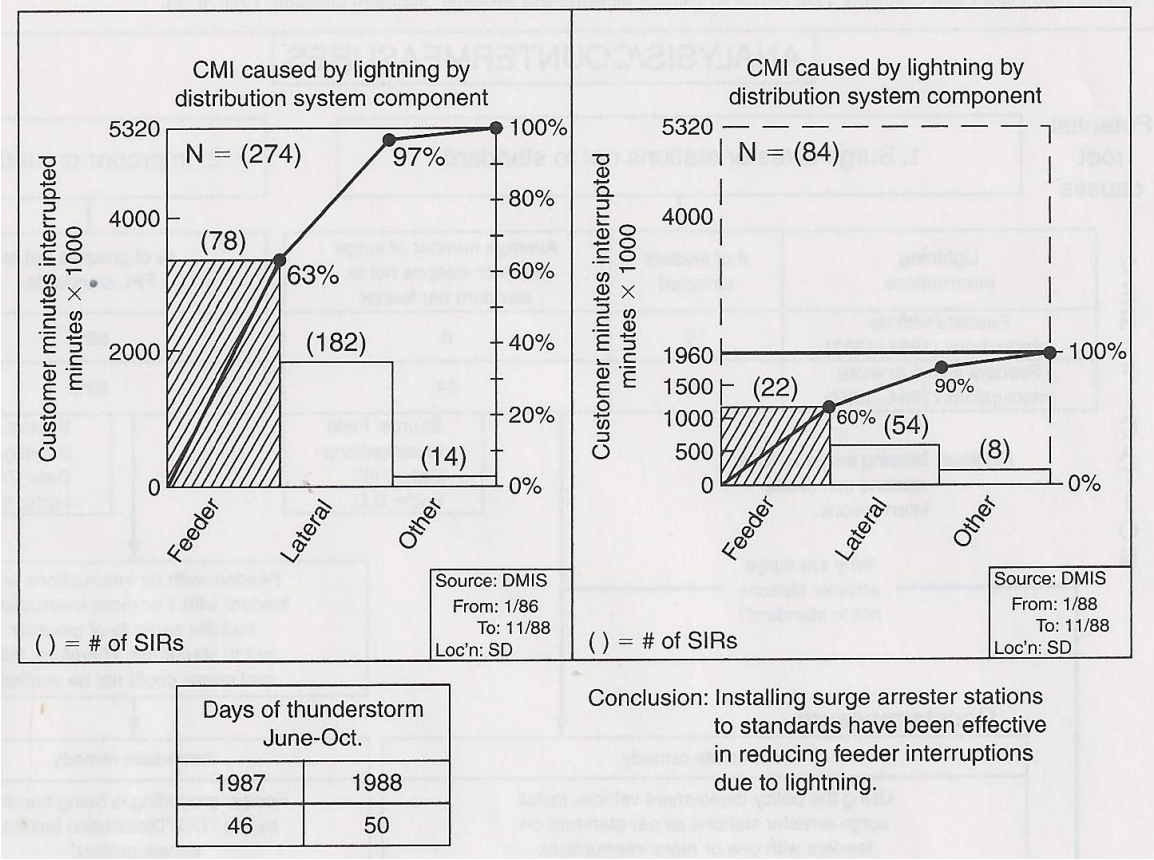
Figure 19.9
Analysis of Feeder Interruptions in the Hialeah District



Of the possible root causes shown in Figure 19.9, “surge arrester stations not to standard,” “improper grounding,” and “no guidelines for small feeder jobs” were identified by the team for further analysis.

From this analysis, team members identified a correlation between feeder interruptions and substandard surge arrester stations, as shown in potential root cause 1 (Surge arrester stations not to standard) in Figure 19.10. Improper grounding as a contributing factor to feeder outages was not verified as a root cause based on analysis of the data, as shown in potential root cause 2 (improper grounding) in Figure 19.10. Nevertheless, the QI team found that 68% of feeders were not up to FPL standards.

Figure 19.11
Comparison of CMI Data Interruptions

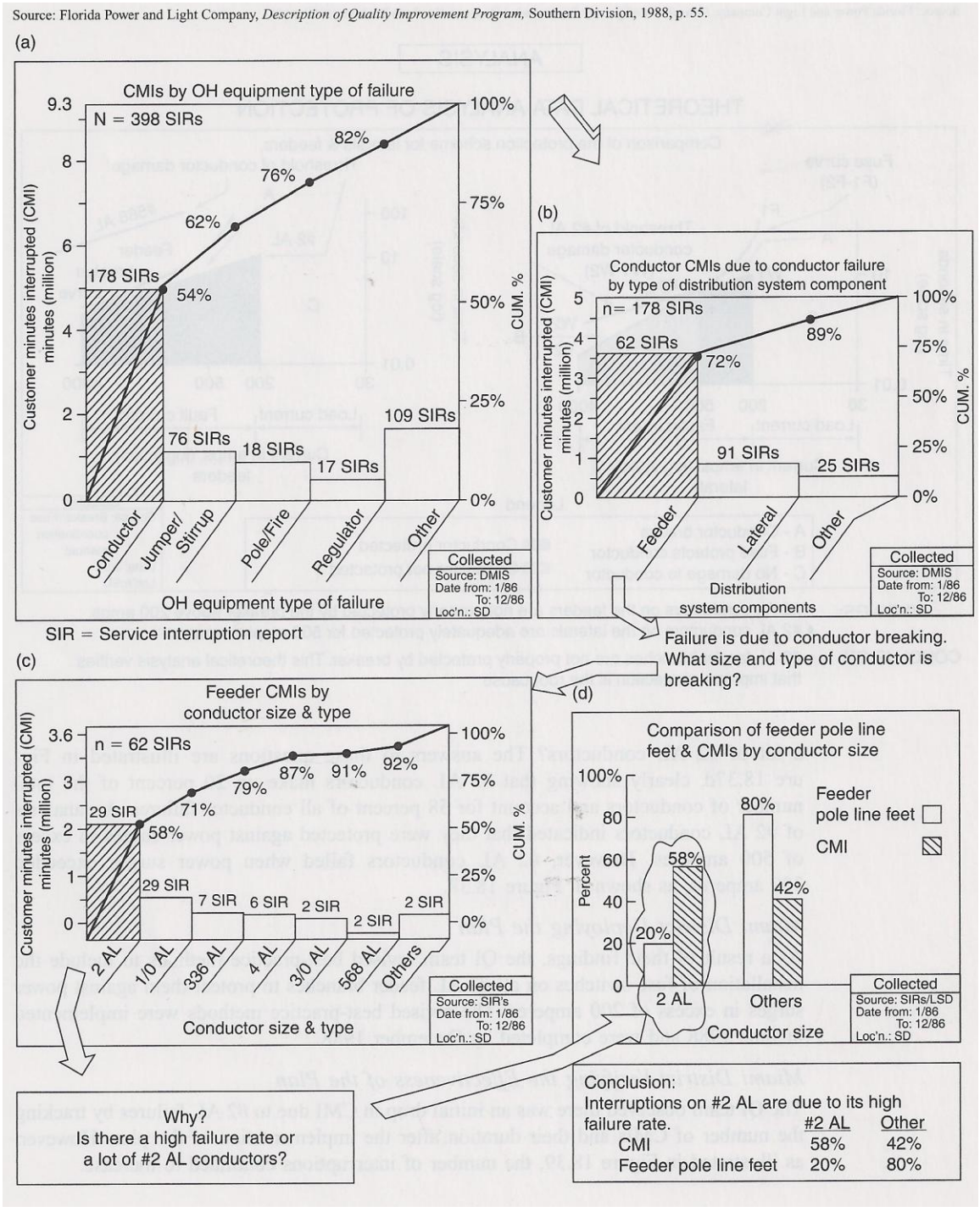


Source: Florida Power and Light Co., *Description of Quality Improvement Program, Southern Division, 1988, p 54.*

Hialeah District Standardizing Policy. These data led to standardization of the revised best practice methods for all divisions of FPL.

Miami District Creating a Plan: Overhead Equipment. A QI team from the Miami District examined the reasons for “Overhead Equipment” failure and organized the causes in a Pareto chart, as shown in Figure 19.12(a). They found that the highest cause of failure was attributable to conductors. Further analysis of conductor failures by the type of distribution system component revealed that the highest number of conductor failures occurred through the feeder distribution system, as shown in Figure 19.12(b). Stratification of the 62 feeder data points was accomplished by asking: “What size and type of conductor is breaking?”

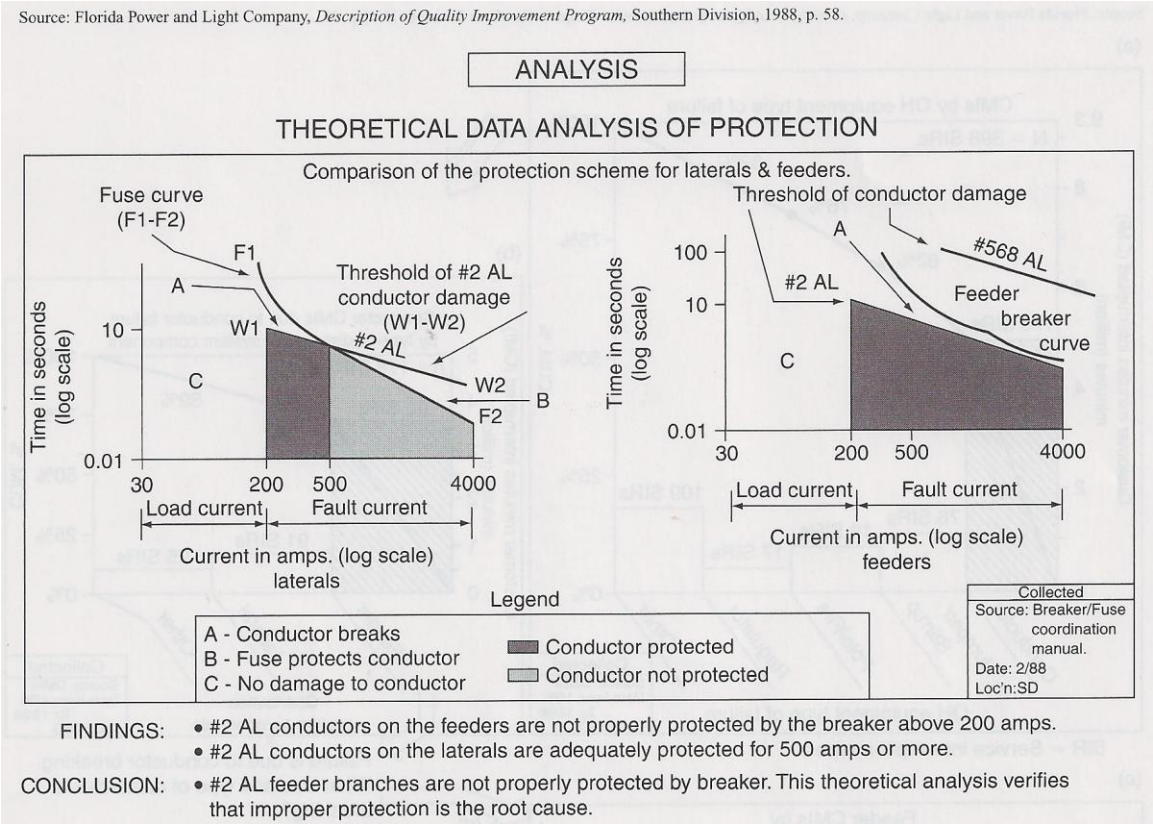
Figure 19.12(a), (b). (c), AND (d)
Miami District Plan



The answer to this question narrowed the scope of the possible root causes to #2AL conductors, as shown in Figure 19.12(c). Further stratification of the data was accomplished by asking: Is there a high failure rate with #2 AL conductors? Or, are there simply a lot of #2 AL conductors? The answers to these questions are illustrated in Figure 19.12(d), which clearly shows that #2 AL conductors make up 20% of the total number of conductors and account for 58% of all conductor failures. An analysis

of #2 AL conductors indicated that they were protected against power surges in excess of 500 amps. However, #2 AL conductors failed when power surges exceeded 200 amps, as shown in Figure 19.13.

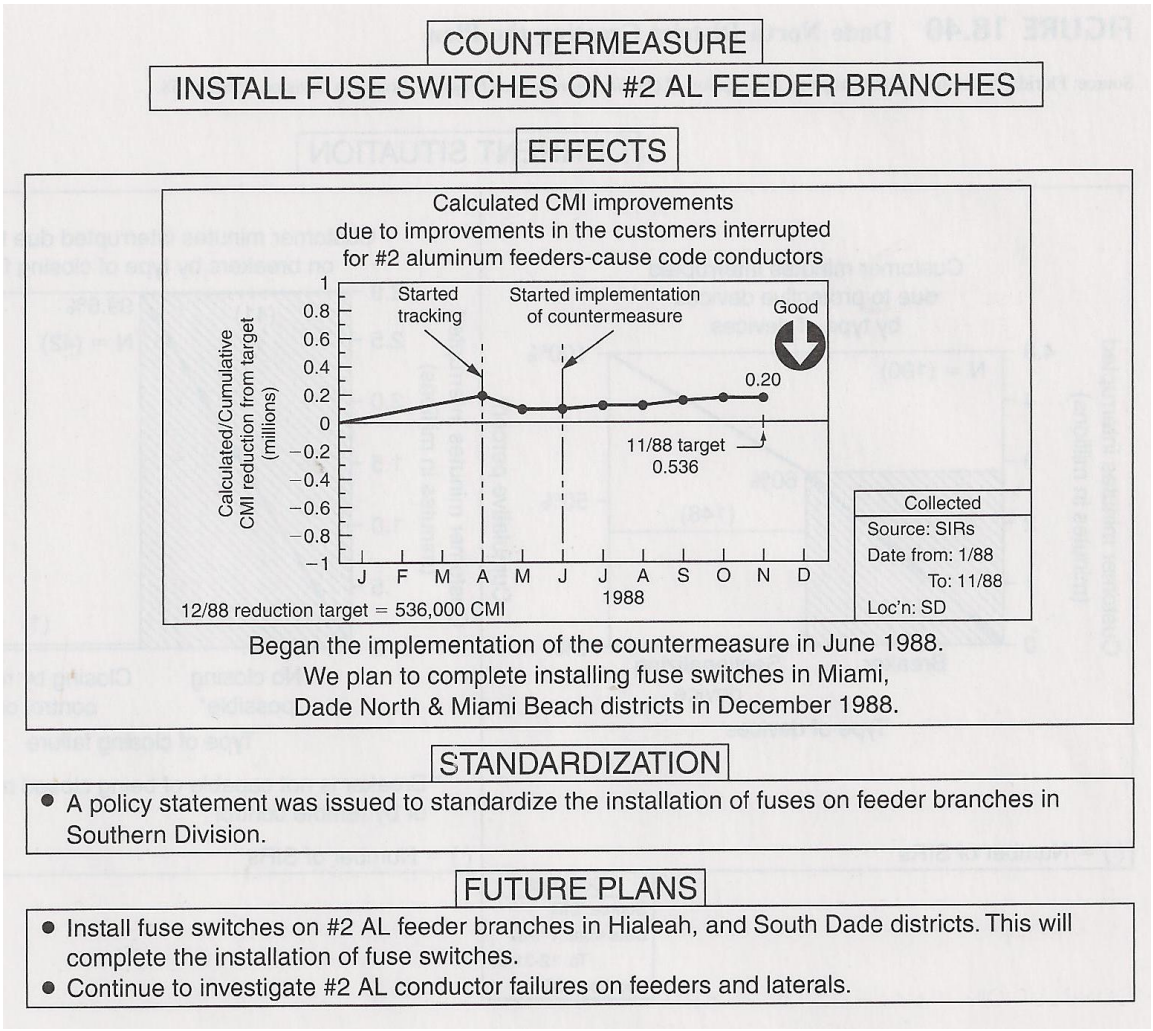
Figure 19.13
Miami District Analyzing the Situation



Miami District Deploying the Plan. As a result of their findings, the QI team revised best practice methods to include the installation of fuse switches on all #2 AL feeder branches to protect them against power surges in excess of 200 amps. The revised best practice methods were implemented in June 1988 and were completed by December 1988.

Miami District Verifying the Effectiveness of the Plan. The QI team observed there was an initial drop in CMI due to #2 AL failures by tracking the number of CMIs and their duration after the implementation of the plan. However, as illustrated in Figure 19.14, the number of interruptions continued to increase.

Figure 19.14
Miami District Verifying the Effectiveness of the Plan

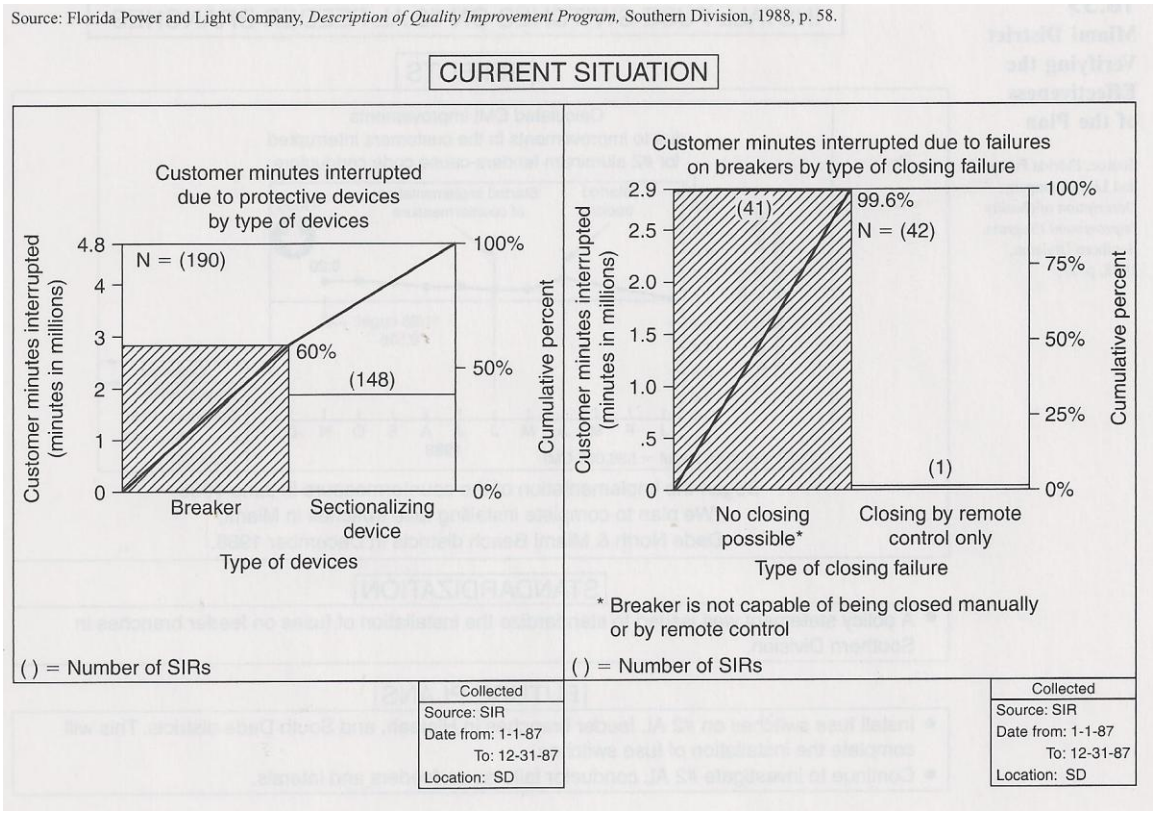


Source: Florida Power and Light Co., *Description of Quality Improvement Program, Southern Division, 1988, p 54.*

Miami District Standardizing the Plan. A policy statement was issued to standardize the installation of fuses on feeder branches in the Southern Division. Further, installation of fuse switches on #2 AL feeders was planned for the Hialeah and South Dade Districts. The QI team had uncovered one part of the problem, but as evidenced by the data, the problem of #2 AL failures was not completely resolved. Continued study of the #2 AL conductor failure problem was indicated to assure all possible causes and solutions had been exhausted.

Dade North District Creating the Plan: Protective Devices. A QI team from the Dade North District was established to study the causes of CMI due to "Protective Devices," as shown in Figure 19.7(c). The team members discovered that the predominant cause of CMI's attributable to "Protective Devices" was the failure of breakers, as shown in Figure 19.15, left panel. Further, of the breakers that failed, the ones that could not be closed, or returned to operative mode, either manually or remotely accounted for the highest CMIs, as shown in Figure 19.15, right panel.

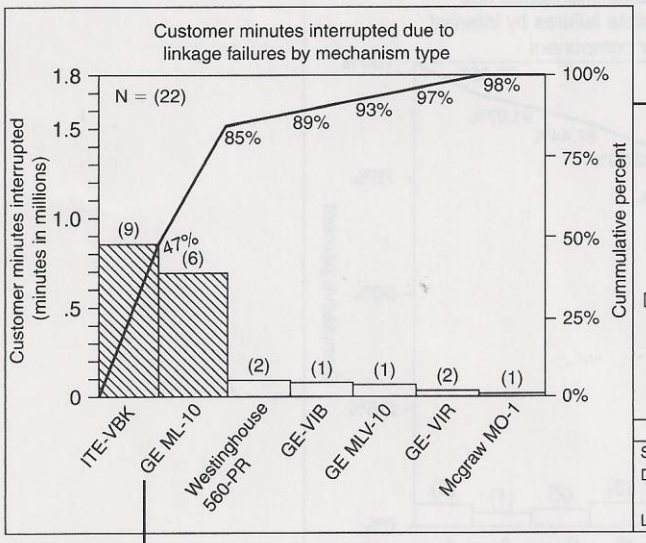
Figure 19.15
Dade North District Plan



Stratification of the data on breakers that failed and could not be closed (41 cases) indicated that "binding linkage" was the most significant cause of failures (binding linkages accounted for 62.46% of CMI), as shown in Figure 19.16. the two linkage types with the greatest contribution to CMI, as shown in Figure 19.17, top panel. An examination of the number of ITE-VBK linkages and GE ML-10 linkages in use made it clear that ITE-VBK linkages were a more significant contributor to CMI than GE ML-10 linkages, as shown in Figure 19.17, right panel. The QI team found that ITE-VBK linkages were failing at a higher frequency than other linkages because they were not within tolerances, as shown in Figure 19.17, bottom panel.

Figure 19.17
Examination of Linkages in the Dade North District

Source: Florida Power and Light Company, *Description of Quality Improvement Program,* Southern Division, 1988, p. 59.



Occurrence rate by type of breakers

MFG/MECH	Number of interruptions	Number of breakers	% occurrence rate
ITE-VBK	9	19*	47.4
GE ML-10	6	126	4.8
all others	7	474	1.5
Totals	22	619	3.5

*1 of 19 ITE-VBK breakers was replaced with a different type during 1988.

☐ Conclusion:
ITE-VBK breakers have a higher occurrence rate than the GE ML-10 and all others.

Collected
Source: TRBL. INV. RPT.
Date: From: 1-1-87
To: 12-31-87
Location: SD

Already being analyzed by the Southeastern Division. Southern Division will replicate countermeasures.

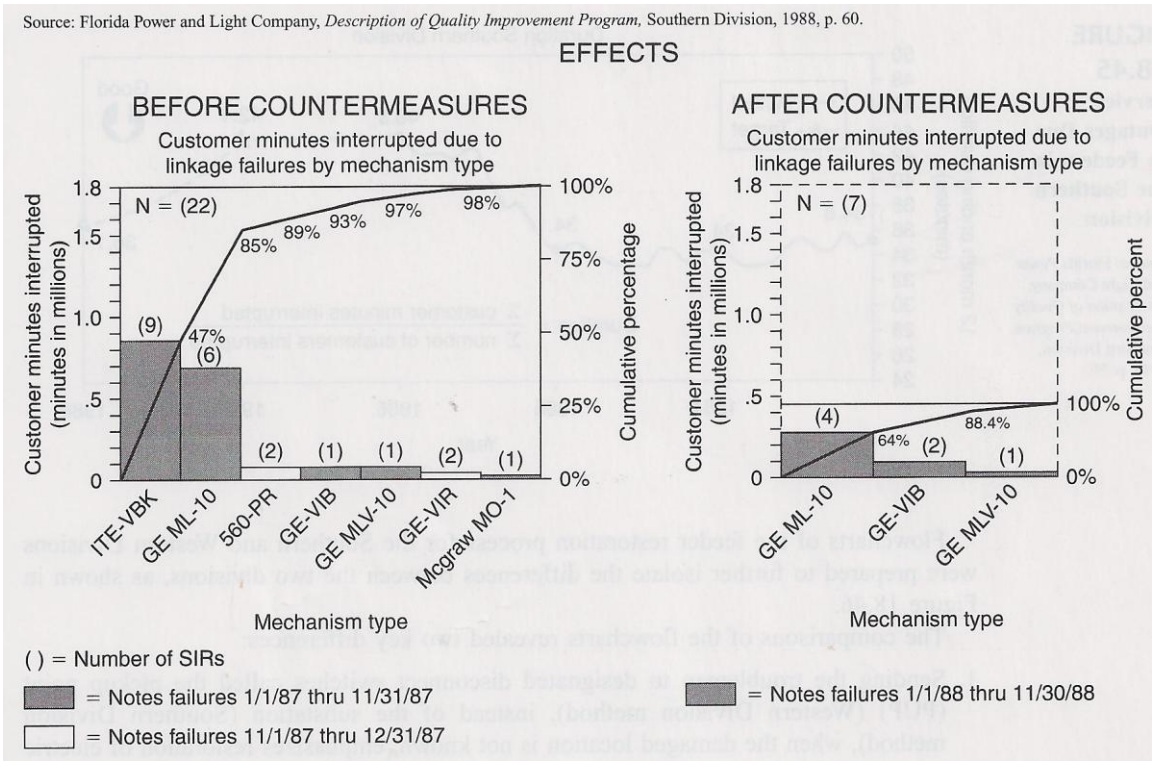
But why such a high occurrence of failures in ITE-VBK breakers?

Symptoms	Occurrence rate	Cause	Verification	Countermeasures
Incorrect latch check switch adjustment	15 of 18	Not within tolerance of .018"-.025"	ITE representative reviewed specifications, inspected breakers and conducted maintenance. Findings: Procedures not sufficiently specific.	1. More specific maintenance procedures required. 2. Additional maintenance training required.
Excessive play in the impact trip coil rods	8 of 18	Did not meet clearance requirements of .0625"		
Mechanisms out of adjustment	4 of 18	Out of pre-set factory adjustment as marked on mechanism.		

The team's proposed revised best practice methods provided for more specific maintenance procedures for ITE-VBK breakers and additional training with respect to maintenance procedures.

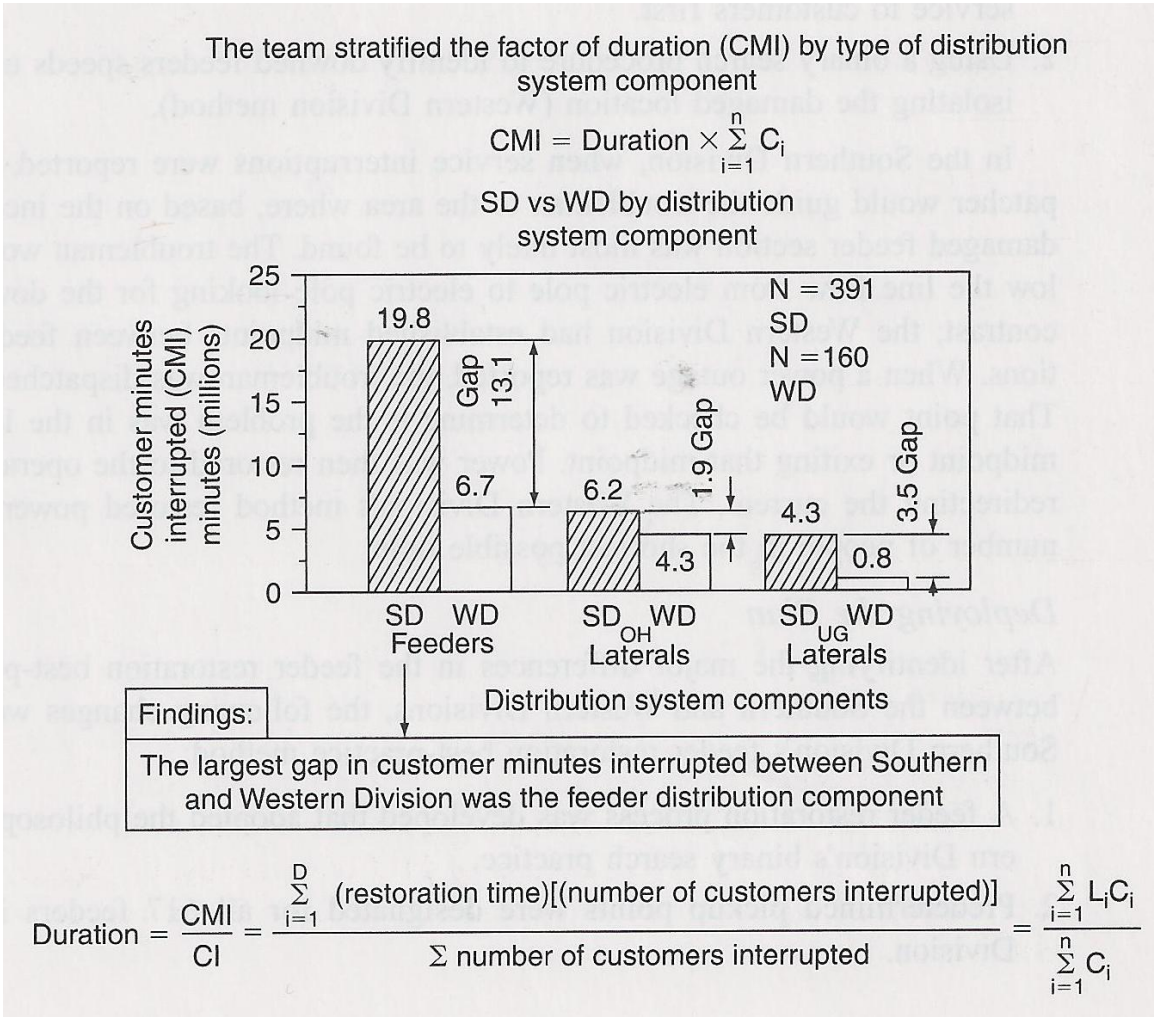
Dade North District Standardizing the Plan. The revised best practice method was very successful in reducing the ITE-VBK linkage problem, as shown in Figure 19.18. As a result, revised best practice methods were instituted in the Dade North District, along with Industrial and Perrine Service Centers, to standardize the maintenance procedures in place prior to February 1989.

Figure 19.18
Standardizing the Plan in the Dade North District



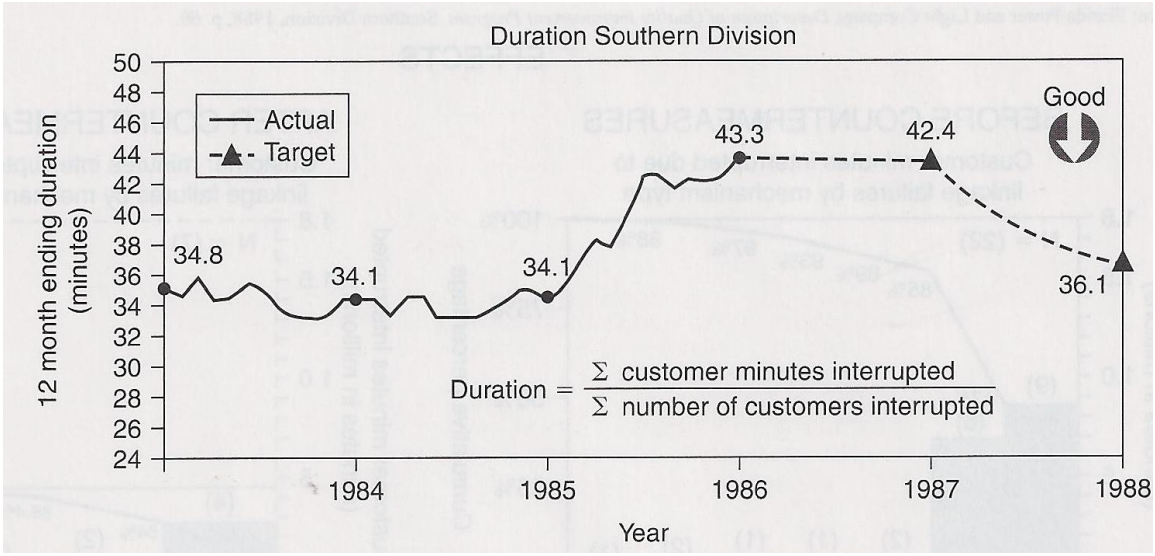
Duration. Duration represents the average number of minutes each customer is without electrical service. It is computed by taking the total number of Customer Minutes Interrupted (CMI) and dividing it by the total number of customers interrupted. A QI team in the Southern Division stratified CMI duration data for a six-month period from July to December 1986 by type of distribution system component and determined that feeders were the major cause of CMI due to duration, as shown in Figure 19.19. The duration of actual and predicted service outages due to feeders in the Southern Division was plotted over time to gain a better understanding of how feeder failures affected total CMI, as shown in Figure 19.20.

Figure 19.19
Causes of CMI Due to Duration
in the Southern Division and the Western Division



Source: Florida Power and Light Co., *Description of Quality Improvement Program, Southern Division, 1988, p 48.*

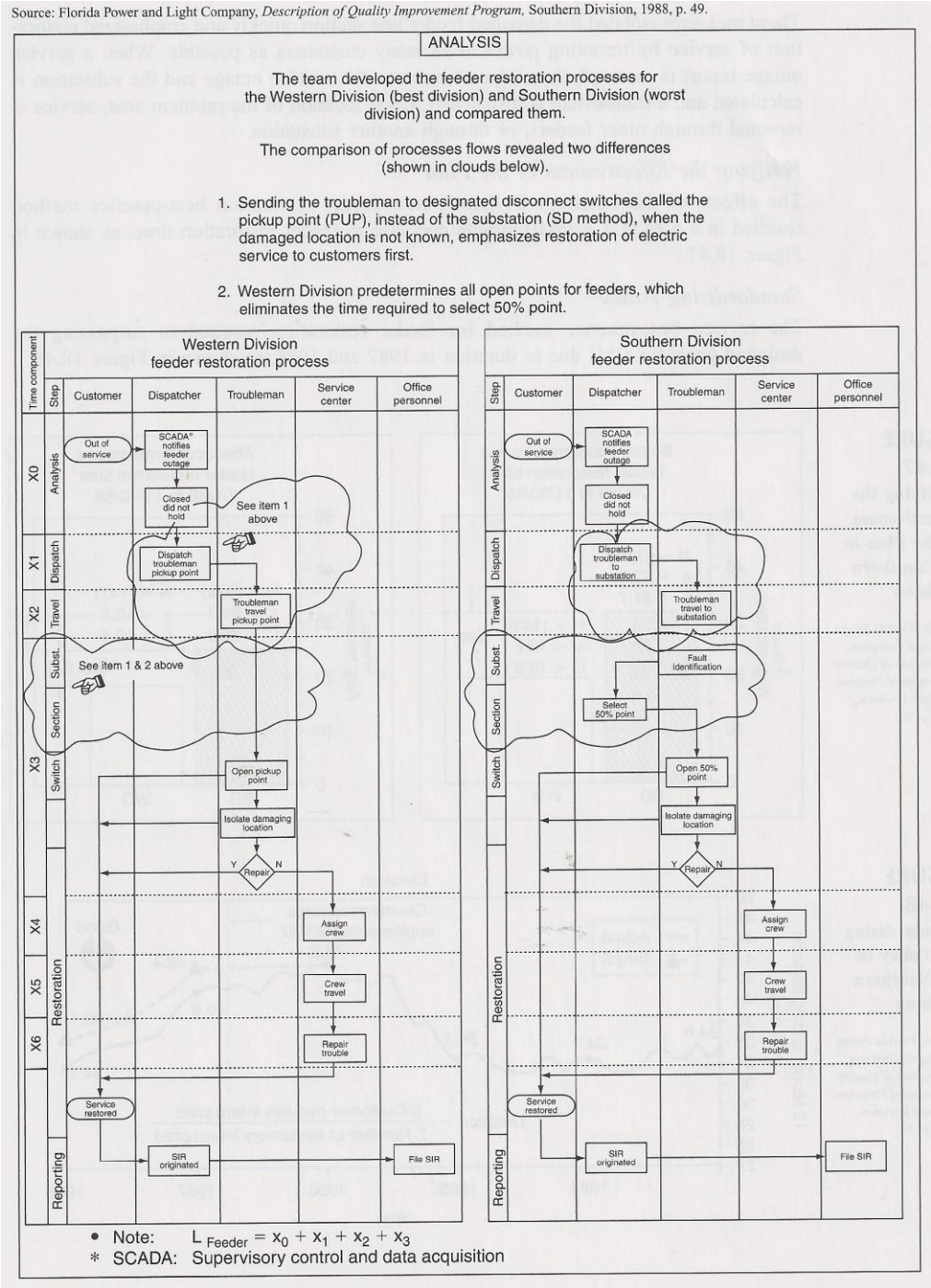
Figure 19.20
Service Outages Due to Feeders in the Southern Division



Source: Florida Power and Light Co., *Description of Quality Improvement Program, Southern Division, 1988, p 59.*

Examining the Feeder Problem. Next, the QI team compared the Southern Division's CMI due to duration against the records of all other divisions. The finding was that the Southern Division had the worst record and the Western Division laid claim to the best record; the difference was 13.1 minutes, as shown in Figure 19.19. Consequently, the Western Division was used as the benchmark for the development of "new feeder restoration" best practice method. Flow charts of the feeder restoration process for the Southern and Western Divisions were prepared to further isolate the differences between the two divisions, as shown in Figure 19.21.

Figure 19.21
Flowcharts of the Feeder Restoration Process for the Southern and Western Divisions



The comparisons of the flow charts revealed two key differences:

1. Sending the Troubleman to designated disconnect switches called the Pick-Up Point (PUP) (Western Division method), instead of the substation (Southern Division method), when the damaged location is not known, emphasizes restoration of electric service to customers first.
2. Using a binary search procedure to identify downed feeders, speeding up the process of isolating the damaged location (Western Division method).

In the Southern Division, when service interruptions were reported, the service dispatcher would guide the troubleman to the area where, based on the incoming calls, the damaged feeder section was most likely to be found. The troubleman would literally follow the line flow from electric pole to electric pole looking for the downed feeder. By contrast, the Western Division had established midpoints between feeders and substations. When a power outage was reported, the troubleman was dispatched to a midpoint. That point would be checked to determine if the problem was in the line feeding that midpoint or exiting that midpoint. Power was then restored to the operational feeder by redirecting the current. The Western Division's method restored power to the greatest number of people in the shortest possible time.

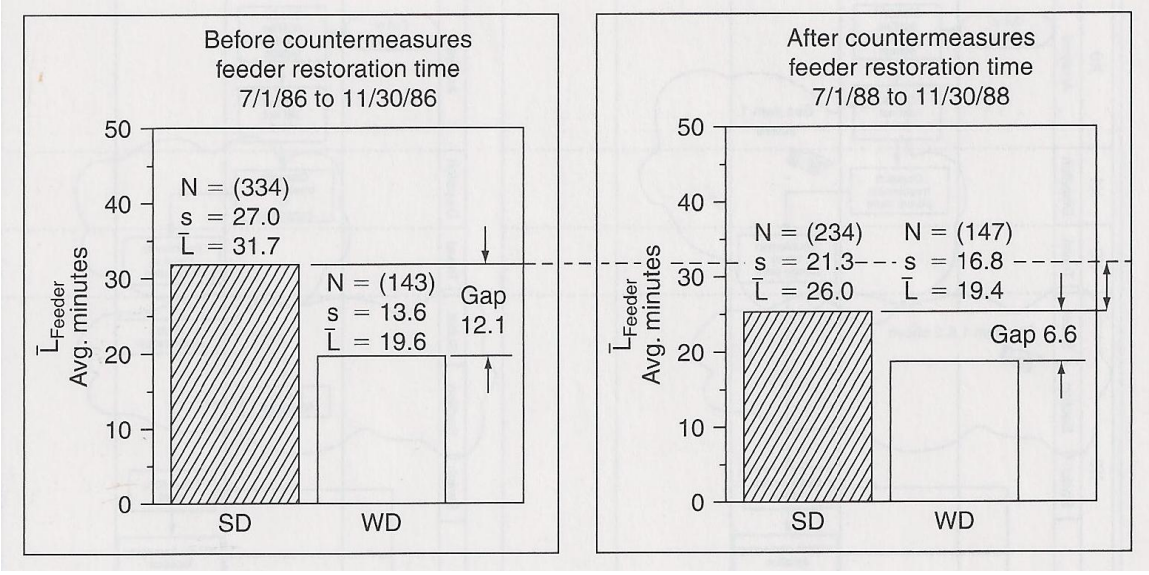
Deploying the Plan. After identifying the major differences in the feeder restoration best practice methods between the Southern and Western Divisions, the following changes were made to the Southern Division's feeder restoration best practice method:

1. A feeder restoration process was developed that adopted the philosophy of the Western Division's binary search practice.
2. Predetermined pick-up points were designated for all 617 feeders in the Southern Division.

These measures isolated the damaged feeder line section quickly and emphasized restoration of service by rerouting power to as many customers as possible. When a service outage report is received, the midpoint between the service outage and the substation is calculated and a troubleman is dispatched. Upon location of the problem area, service is rerouted through other feeders, or through another substation.

Verifying the Effectiveness of the Plan. The effects of the Southern Division's new feeder restoration best practice method resulted in a 5.7 ([L=31.7 before] –[L=26.0 after]) minute decrease in feeder restoration time, as shown in Figure 19.22.

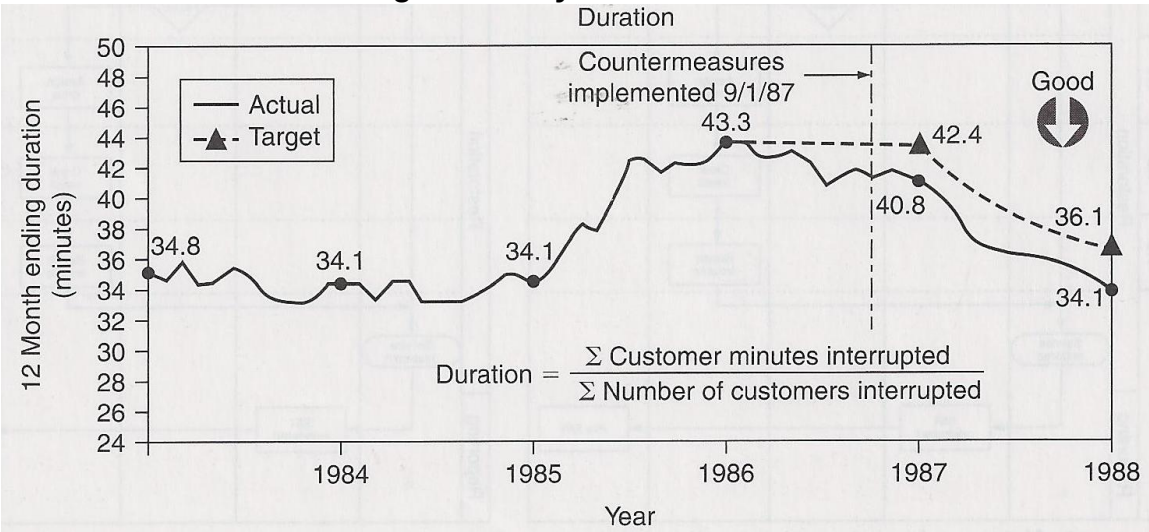
Figure 19.22
Verifying the Effectiveness of the Plan in the Southern Division



Source: Florida Power and Light Co., *Description of Quality Improvement Program, Southern Division, 1988, p. 50.*

Standardizing Policy. The revised best practice method for feeder restoration resulted in surpassing the designed goals for CMI due to duration in 1987 and 1988, as shown in Figure 19.23.

Figure 19.23
Standardizing the Policy in the Southern Division



Source: Florida Power and Light Co., *Description of Quality Improvement Program, Southern Division, 1988, p. 49.*

19.1.4 Review of FPL Case Study

FPL's QIP is driven by the Voice of the Customer. The organization conducts extensive customer surveys to identify the needs of its diverse customer segments, and then prioritizes the needs of its customers through the development and use of the Table of Tables.

Next, the Executive Committee develops a strategic plan that reflects the needs of the customers, as well as the realities of FPL's competitive environment.

The Voice of the Customer, as reflected in the strategic plan, is disseminated throughout the organization by the Policy Deployment Committee. Next, each division submits a business plan to the Policy Deployment Committee. The business plans are approved and funded by the Policy Deployment Committee. FPL's QIP involves everyone in the organization in setting and meeting business plans through Daily Management. Daily Management provides a system for translating corporate policy into daily best practice methods which can be standardized and improved via the SDSA and PDSA cycles.

Employees of FPL were able to resolve their four crises through their QIP. The accomplishments of FPL employees culminated in 1989 when John J. Hudiburg, then CEO of FPL, accepted the coveted Deming Prize from the Japanese Union of Scientists and Engineers.

19.2 The Evolution of Quality at Florida Power & Light[1]

The quality process at Florida Power & Light Company has evolved and matured through multiple phases, including those leading up to the Deming Prize in 1989 and equally important, those that evolved or advanced the process to respond to market changes. The four phases defining the evolution of quality are the preliminary phase, intensification phase, mature phase, and the high performance phase.

19.2.1 Preliminary Phase (1981-1985)

The first formal quality efforts began in 1981 with the introduction of quality improvement teams. Top management was encouraged to learn more about the TQM process as a means to address current challenges of the company. Operating costs were rising higher than inflation and customer dissatisfaction was increasing. Despite being a natural monopoly, management believed there was a better way to run the business. After reviewing several models, FPL selected the Japanese model and engaged the services from the Union of Japanese Scientists and Engineers (JUSE) and established a relationship with The Kansai Electric Power Company in Osaka, a 1984 Deming Prize winner. With the assistance of its Japanese friends and counselors, the quality improvement program (QIP) was developed and implemented company-wide in 1985. The employees during this phase were introduced to the seven basic quality improvement (QI) tools and team management techniques.

19.2.2 Intensification Phase (1986-1989)

The initial phase was succeeded by the intensification phase that brought a stronger alignment to company performance and further developed capabilities of the FPL's employees. To inculcate the skills into the culture, employees were required to use a rigorous seven-step problem solving process, called the "QI Story," when attempting to solve problems. Employees were reviewed for their abilities in demonstrating their use of the seven basic QI tools. In this phase, two new elements were added to evolve into a TQM system: Policy Deployment and Quality in Daily Work. Policy Deployment enabled employees to focus on a few company-wide high priority issues rather than dilute their impact by working on local matters of lesser impact. Quality in Daily Work provided the beginning of statistical process control and strengthened the understanding and relationship of internal customers to external customers. Two percent of the employees were trained as "Application Experts" (AEs) in more sophisticated tools and techniques. They learned and applied tools and techniques such as Weibull Analysis, Failure Modes and Effects Analysis, Regression Analysis, Design of Experiments, and general reliability tools and techniques.

Teams, Policy Deployment, and Quality in Daily Work constituted a TQM quality system supported with an employee education and development foundation. Two structures were launched to reinforce the new culture, application of tools and techniques, and sharing solutions. The EXPO structure was a convention-like atmosphere with booths, exhibits or storyboards displaying various improvements. In 1987, the President's Cup Team Competition began as a mechanism to judge the "quality of

[1] This section was prepared by J. Michael Adams, Director of Quality, FPL Company/FPL Group, Inc., May 2000. The authors thank J. Michael Adams and FPL for their generous support in the preparation of this case study.

quality” throughout the organization and role model various tools and techniques reflective of the development strategy.

Around the same time, hundreds of visitors to FPL were gaining further insight into the quality movement. Although FPL had adopted the Japanese quality approach, it played a leadership role in the founding of the Malcolm Baldrige National Quality Award, testifying to the U.S. Congress as to its benefits for the American economy, crafting the criteria, and assisting with endowing the award.

In the summer of 1988, a decision was reached that FPL would challenge for the Deming Prize. The challenge that lasted for almost an entire year required employees to accelerate the pace of improvements and to put in many extra hours for further development or preparation for the exam itself. Commensurate with this effort, building TQM capabilities also provided operational benefits including substantial reduction in unplanned power plant outages and dramatic reductions in customer complaints, service reliability, and personnel injuries. In November 1989, after an intensive two-week onsite examination, FPL became the first non-Japanese company to win the Deming Prize.

19.2.3 After the Deming Prize (The 1990s)

The Deming Prize is presented to an organization that demonstrates the potential to systematically improve its performance. A quality system therefore must endure and accommodate change to be successful in its performance objectives.

The early 1990’s posed a series of changes internally and externally to FPL, including a new CEO, a changing marketplace, and the catastrophic Hurricane Andrew, all of which had impact on the approach, deployment, and reinforcement of the tenets of quality.

19.2.4 Mature Phase (1990-1997)

The new CEO, James L. Broadhead, recognized the changing marketplace as well as the potential of the organization. He altered the course of FPL to compete in a deregulated marketplace. A key success factor in a competitive marketplace is to be a low cost provider. In 1989 however, FPL was the highest-cost major electric utility in its region.

While winning the Deming Prize was an honor of which all employees were proud, there was a widespread feeling among employees that FPL’s quality program had become very mechanical and inflexible. The paper-oriented bureaucracy that served the organization in its development was actually now creating barriers to continuous improvement. At this point in the quality journey, the employees were a well-developed, homogenous group with thorough process and tools knowledge. At the same time, the rate of change toward deregulation was underestimated and the transition from monopoly to competition would be realized sooner, thus requiring a more flexible and faster organization. The mature phase is one that fully integrated the TQM components into the general business structure.

An employee team was assembled to review and provide recommendations to advance the quality program. Some of the recommendations included easing up on the mandatory structures that prohibited the benefits of the workforce’s knowledge to be applied toward performance rather than process. Some primary changes to the system included no longer requiring the seven-step QI story for all problem solving, ultimately dispersing the rather large quality staff to positions within the operating organization, and maintaining a small corporate quality office as part of a company-wide reorganization. This office would interface with contemporary marketplace practices like

benchmarking and reengineering to keep the organization current. Quality was positioned as part of the way FPL does business. Quality plans and business plans were no longer separate and management would take on the role of facilitator and coach to improvement as a part of their job.

The reorganization was the outcome of eight employee teams researching various disciplines including human resources, the marketplace, regulatory issues, and technological advancements. With it came a new vision: “to be the preferred provider of safe, reliable, cost effective electricity-related products and services for all customer segments.”

Supporting the vision included four areas of focus listed as strong customer orientation, commitment to quality, cost-effective operations, and speed and flexibility that were maintained throughout the ‘90’s, adding safety in 1999. The Divisions and District geographic areas and layers of management were eliminated, reducing the layers from twelve to five. In light of the changing marketplace, and the new vision and areas of focus, the performance measures were also changed commensurate to a competitive market. With the new direction, the capabilities could be exercised to perform with alignment and contribution to the areas of focus.

In 1994, FPL underwent a Post-Deming Prize Review at the request of the Chairman. Overseas winners of the Deming Prize can volunteer for the review, while in Japan it is mandatory. It is usually conducted three years after the award. FPL’s original request was deferred, however to allow for the restoration and recovery from Hurricane Andrew in August 1992. Dr. Kume and Dr. Akao conducted the review. Both were Deming Prize examiners in 1989 and requested to review those sites they had previously visited and knew thoroughly.

They reviewed power plants, a customer care center, and conducted sessions with most operating and staff groups concluding with the executive team. They appraised the organization’s realization of its potential for business performance citing best practices in benchmarking, empowerment, creative use of technology, and quality promotion. As with any review, they also provided guidance to further improve the system. Jim Broadhead was asked to present FPL’s evolution and results of the review at the International Conference on Quality in Yokohama, Japan in 1996.

High Performance Phase (1997-2005). In 1997, the quality system evolved to further advance the organization commensurate to the competitive marketplace while assessing the new fledgling business initiatives at FPL and the skills of a growing, new workforce. Using a customized version of the Baldrige Criteria, a team of internal experienced assessors performs assessments on business units and gauged the organization relative to the four phases. Sample characteristics describing a high performance organization include work systems for enterprise profitability, leveraged use of technology, backward and forward integration, customization, upper decile performance, and leveraged learning. In 1999, following nine business unit assessments, a core team of examiners analyzed its findings and drafted recommendations for organizational continuous improvement to the senior executives.

FPL concluded the decade and millennium with the high levels of performance as well as continued contribution and leadership to the quality movement. The EXPO continues as a sharing opportunity for all employees of FPL Group, Inc. while the President’s Cup Team competition enters its fourteen year. The 1990’s proved successful with dramatic improvements. Decade-end performance was at all time highs with segmented customer satisfaction levels at targeted levels, fossil plant availability reached 93% (up from 77% in 1990), while nuclear availability reached 94% (up from 77% in 1990). The power plants performed at upper decile performance levels and have provided that capability to FPL Energy, a new power generation subsidiary of FPL Group, Inc. Other performance achievements

include O&M cost reduction of 36% since 1990 at residential electricity prices 16% below those of 1985 (8.34 cents/kWh compared to 6.97 cents/kWh). Considering inflation, that equates to over a 60% difference. Service reliability had some variation in the early decade, but since 1997 alone there has been a 45% improvement in reliability at levels significantly better than the national average. Improvement occurred in reducing the average length of interruption as well as the frequency.

Jim Broadhead was 1999-2000 president of the Foundation for the Malcolm Baldrige National Quality Award while other employees serve as judges and examiners for various quality awards in the nation.

The quality system continues to evolve, driven by market conditions and practices and certainly with lessons learned throughout.

19.3 Summary

This chapter presents a business application of Policy Management at the Florida Power and Light Company. This example demonstrates the steps of policy management and how they are implemented.

REFERENCES AND ADDITIONAL READINGS

[1] *FPL's Total Quality Management-Participant Handbook*, 1st edition, (1990) by the University of Miami Institute for the Study of Quality in Manufacturing and Service and QUALTEC, INC. (An FPL Subsidiary).

[2] Florida Power & Light Company, Research, Economics, and Forecasting Department (1990), *Supplement to the Customer Needs Table of Tables* version 5.

[3] H. Gitlow and E. Loredo., "Total Quality Management at Florida Power & Light Company: A Case Study," *Quality Engineering*, vol 5, no. 1 (1992-1993), pp. 123-158.

[4] H. Gitlow and PMI 1990, *Planning for Quality, Productivity and Competitive Position* (Homewood, IL: Dow Jones-Irwin).

[5] Noriaki Kano (October 1, 1986), *Second Report on TQC at Florida Power & Light Company* (Miami, FL).

Appendix A18.1
The Voice of the Customer

The term "customer" includes both external customers and indirect customers [FPL's Total Quality Management Handbook, 1993, unit 12, p. 4]. External customers are the organizations or individuals who buy or use an organization's goods or services. Indirect customers are organizations that guard the welfare of external customers, such as regulatory commissions and governmental agencies. The term "indirect customer" was introduced by Florida Power & Light Company.

The Voice of the Customer [FPL's Total Quality Management Handbook, 1993, unit 12, p. 4 and pp. 10-22] is a tool used to: (1) define the ever-changing market segments for customers, (2) determine and prioritize the customer requirements of each market segment, (3) identify the processes or methods used to respond to the customer requirements of each market segment, (4) construct a matrix that explains the relationships between "the customer requirements of each market segment" and "the processes or methods used to respond to the customer requirements," and (5) prioritize the processes or methods used to respond to customer requirements. Data collected from a Voice of the Customer analysis is used to formulate the strategic objectives of an organization. The steps for conducting a Voice of the Customer study are shown below.

(1) ***Define the ever-changing market segments for customers***. The term "market segment" explains the dynamic and changing homogeneous groupings of customers with respect to the demographic, psychographic, and purchasing behavior variables that affect their decision to purchase and/or use a good or service. Focus groups and surveys, as well as other tools, are used to identify customer requirements for each market segment. Special care is taken to identify and define the customer requirements of non-customers and future market segments.

(2) ***Determine and prioritize the customer requirements of each market segment.*** Management collects and analyzes observational, survey, and experimental data to understand the Voice of the Customer by market segment. The question asked of a sample of customers from each market segment is, "From your perspective, what requirements must the organization surpass to pursue the mission statement?"

For example, Figure A.19.1 shows a prioritized list of customer requirements that were collected by randomly sampling Florida Power & Light residential customers. For each market segment, each customer requirements is scored on three scales: first, an "importance to the customer" scale; second, a "current level of performance in the eyes of the customer" scale; and third, a "desired level of performance by management to optimize the interdependent system of stakeholders" scale. The "total weight" is computed for each customer requirement in each market segment. Total weight is a measure of the need to take action on a customer requirement, a prioritization procedure adapted from the Quality Function Deployment Methods of Akao, as shown on the right side of Figure A19.1.

Figure A19.1
Prioritized List of Customer Requirements

Number	Direct Quality Requirements	Total Weight
1	Quality repair work	9.42
2	Accurate electric bills	9.41
3	Honest trustworthy management	9.33
4	Safely maintained company equipment	9.27
5	Fair treatment of all customers	9.27
6	Friendly and courteous employees	9.26
7	No damage to customers or public property	9.17
8	Accurate answers to questions	9.15
9	Quickly restored power	9.14
10	Safe nuclear plants	9.10
11	Low environmental pollution	9.03
12	Electricity is good value for the money	9.01
13	Timely actions on customers' complaints	8.99
14	Concern for customers' problems	8.97

Source: *FPL's Total Quality Management-Participant Handbook*, 1st ed., Copyright 1990 by the University of Miami Institute for the Study of Quality in Manufacturing and Service and QUALTEC, INC. (An FPL Subsidiary), Unit 12, p. 13.

The "importance to the customer" scale quantifies the importance of customer requirements for each market segment; it does not quantify how well the organization is currently handling customer requirements or how much improvement is required with respect to customer requirements. The scale is a one (1) to five (5) scale, where 1 = very unimportant and 5 = very important. "Importance to the customer" scores are obtained by computing the average ratings for each customer requirement for each market segment from survey and/or focus group data. Please note that averaging this type of data is not statistically appropriate; we do it just to get a feel for the typical importance to customer rating.

The "current level of performance" scale quantifies the gap between customer requirements and organizational performance. This scale is a one (1) to five (5) scale, where 1 = very large gap and 5 = very small gap. The measure of current performance scale is obtained by computing the average ratings from survey or focus group data for each customer requirement for each market segment from the following question: "How is the organization doing with

respect to exceeding customer requirement x?" Again, please note that averaging this type of data is not statistically appropriate; we do it just to get a feel for the typical importance to customer rating.

Customer requirements that show a significant gap are targeted for further study via gap analysis. For each customer requirement and market segment, gap analysis requires a measure of customer requirements, given by the "importance to the customer" scale, and a measure of current organizational performance, given by the "current level of importance" scale, to highlight the customer requirements that should be studied further with gap analysis.

Gap analysis is a procedure for studying the root cause(s) of the difference between customer requirements and organizational performance. It is based on the analysis of relevant data. Many different tools are helpful in gap analysis, such as flowcharting, the seven basic QC tools, and benchmarking. For example, the members of the EC might assign a group of staff personnel to study the root causes of the gap for a particular market segment. The group might study the gap over time and determine that it is stable and contains only common variation. Next, they could construct a Pareto diagram of the common causes of the gap, isolate the most significant common cause, and develop a cause and effect diagram. Next, the staff personnel would study the correlation between the suspected root cause and the most significant cause of the gap. If the staff personnel found the correlation to be significant, they would recommend to the members of the EC a plan of action for improving the current level of performance for that customer requirement.

The "desired level of performance" scale quantifies the desired level of performance for each customer requirement, for each market segment. The scale is a one (1) to five (5) scale, where 1 = small improvement in the organization's ability to exceed a customer requirement, and 5 = large improvement in the organization's ability to exceed a customer requirement. "Desired level of performance" scores are developed by staff personnel assigned by the EC. They conduct analyses of the levels of performance required for each customer requirement, for each market segment, to stay ahead of other organizations in the industry (using benchmarking) and future customer requirements. Please note that averaging this type of data is not statistically appropriate; we do it just to get a feel for the typical importance to customer rating.

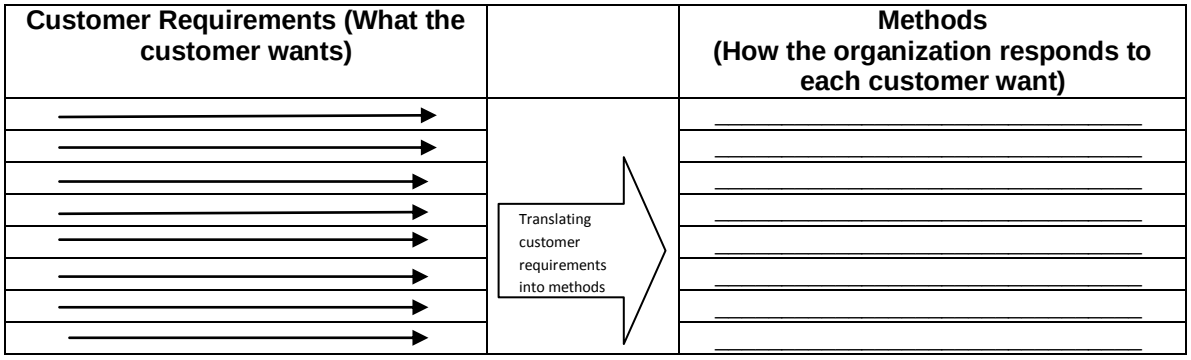
The "total weight" score is a measure of the importance of the gap for each customer requirement, in each market segment. "Total weight" scores are computed as follows:

$$\text{Total Weight} = [I \times D]/C$$

where:
I = importance to the customer
D = desired level of performance
C = current level of performance

(3) ***Identify the processes (methods) used to respond to the needs and wants of each market segment and indirect customer***. It is critical that the needs and wants of each appropriate market segment or indirect customer be serviced by identifiable methods. Customer needs and wants are translated into improved and innovated methods by asking what methods are necessary to respond to each customer need or want. Figure A19.2 may be helpful.

Figure A19.2
Translating Customer Requirements into Methods

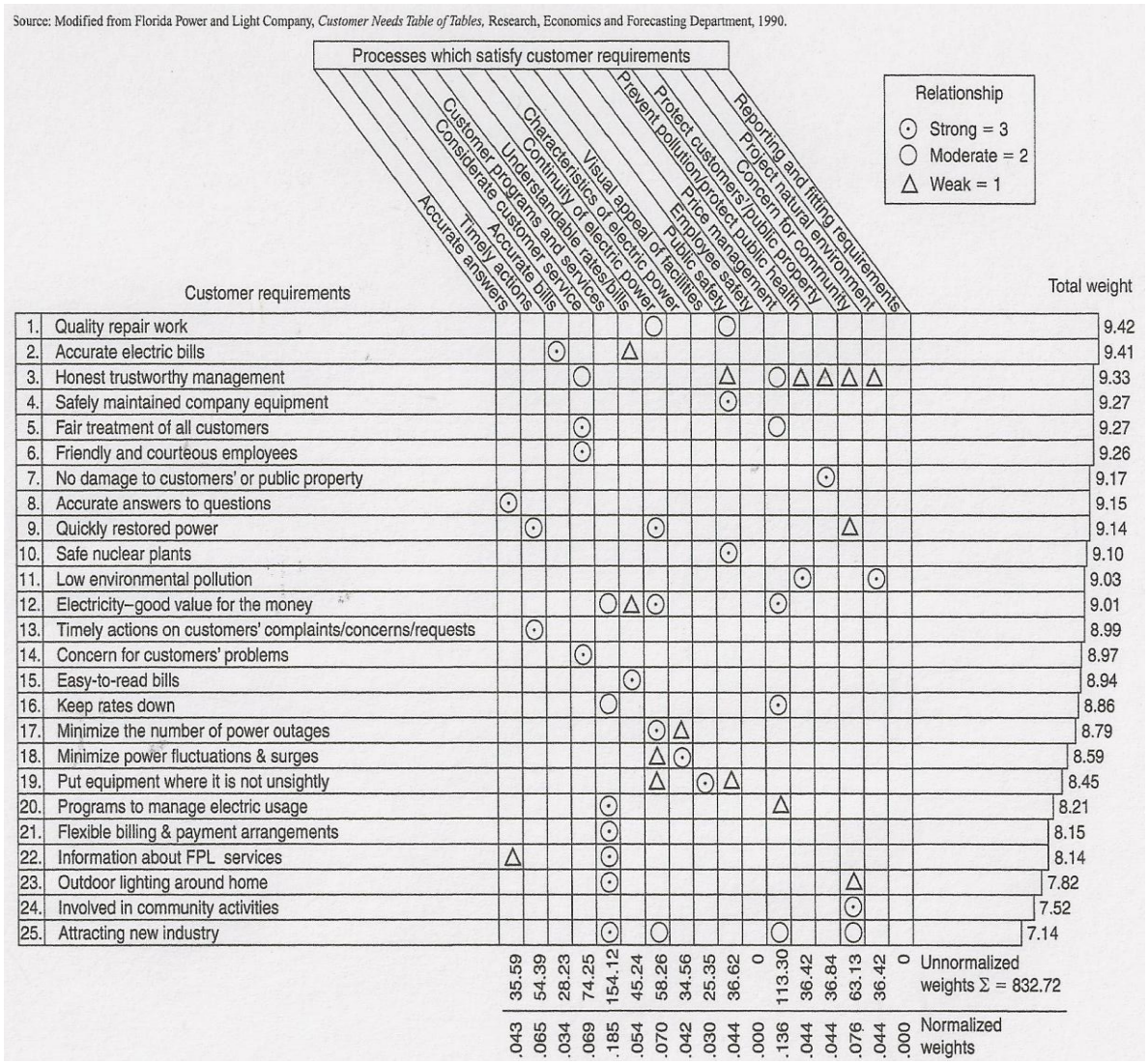


Source: *FPL's Total Quality Management-Participant Handbook*, 1st ed., Copyright 1990 by the University of Miami Institute for the Study of Quality in Manufacturing and Service and QUALTEC, INC. (An FPL Subsidiary), Unit 12, p. 15.

(4) Construct a matrix that explains the relationships (cells of the matrix) between "customer requirements" (rows) and "the processes (methods) used to respond to customer requirements" (columns), for each market segment and each indirect customer. The matrices for all market segments should have the same columns, or given market segment.

The relationships shown in the cells of each matrix are determined by a group of staff personnel assigned this responsibility by the EC. The staff uses its knowledge of the organization and customers, along with that of other knowledgeable people, to determine the relationships. The staff members assigned to determine the relationships between the rows and columns keep a record of their logic for each symbol placed in the matrix, so they will not be second-guessed at a later date. Relationships are measured on the following scale, where 3 = strong relationship, 2 = moderate relationship, 1 = weak relationship, and blank = no relationship. Sometimes, a doughnut symbol is used for a 3, a circle symbol is used for a 2, and a triangle symbol is used for a 1. These numbers or symbols are used whether the relationships are positive or negative. A matrix showing the needs and wants of a particular market segment and the methods needed to respond to the needs and wants of the customers in the market segment can be seen in Figure A19.3.

Figure A19.3
Voice of the Customer Matrix for Residential Customers of FP&L Company
Figure A19.4
Computation of Unnormalized and Normalized Weights



a. Prioritize the normalized weighted values over all methods to provide input into the selection of strategic objectives for the organization. For example, the above analysis indicates that "timely answers" would receive a higher priority for attention than "accurate answers."

Appendix A18.2
The Voice of the Business

The Voice of the Business is a tool for collecting and analyzing data about employee requirements, such as concerns and fears, with respect to the mission of an organization. Voice of the Business studies requires that all groups of employees answer the following question: "What requirements (e.g., concerns and fears) do you have in respect to the organization pursuing its mission?" Data from the answer to this question helps to formulate the strategic objectives of an organization. The procedure for conducting a Voice of the Business study is described below.

(1) Collect and analyze the answers to the question posed above for each employee group, for example, top management, middle management, first line supervisors, and hourly employees. Brainstorming sessions, focus groups, surveys, and management reviews are examples of tools that are useful in collecting information about the above question. Affinity diagrams, interrelationship diagraphs, and cause and effect diagrams are examples of tools that can be used to analyze the answers to the above question. These tools are discussed in Chapter 10 and in FP&L, Research, Economics, and Forecasting Department, 1990.

(2) See step 2 in Voice of the Customer. Determine and prioritize the employee requirements of each employee segment. Employee requirements are determined for each employee group, just as customer requirements are determined for each market segment and indirect customer.

(3) Identify the processes (methods) used to surpass the employee requirements for each employee group. These processes are the same as or additions to the processes used to address the customer requirements in a Voice of the Customer study, as discussed in Appendix A19.1. Employee requirements are used in developing strategic objectives for the organization.

(4) Construct a matrix that explains the relationships (cells of the matrix) between "employee requirements" (rows) and "the processes (methods) used to respond to employee requirements" (columns), for each employee segment. All Voice of the Customer and Voice of the Business matrices should have the same columns, as shown in step 4 in Appendix A19.1.

(5) Prioritize the processes (methods) used to respond to employee requirements for attention in the strategic objectives of the organization. See step 5 in Appendix A19.1.

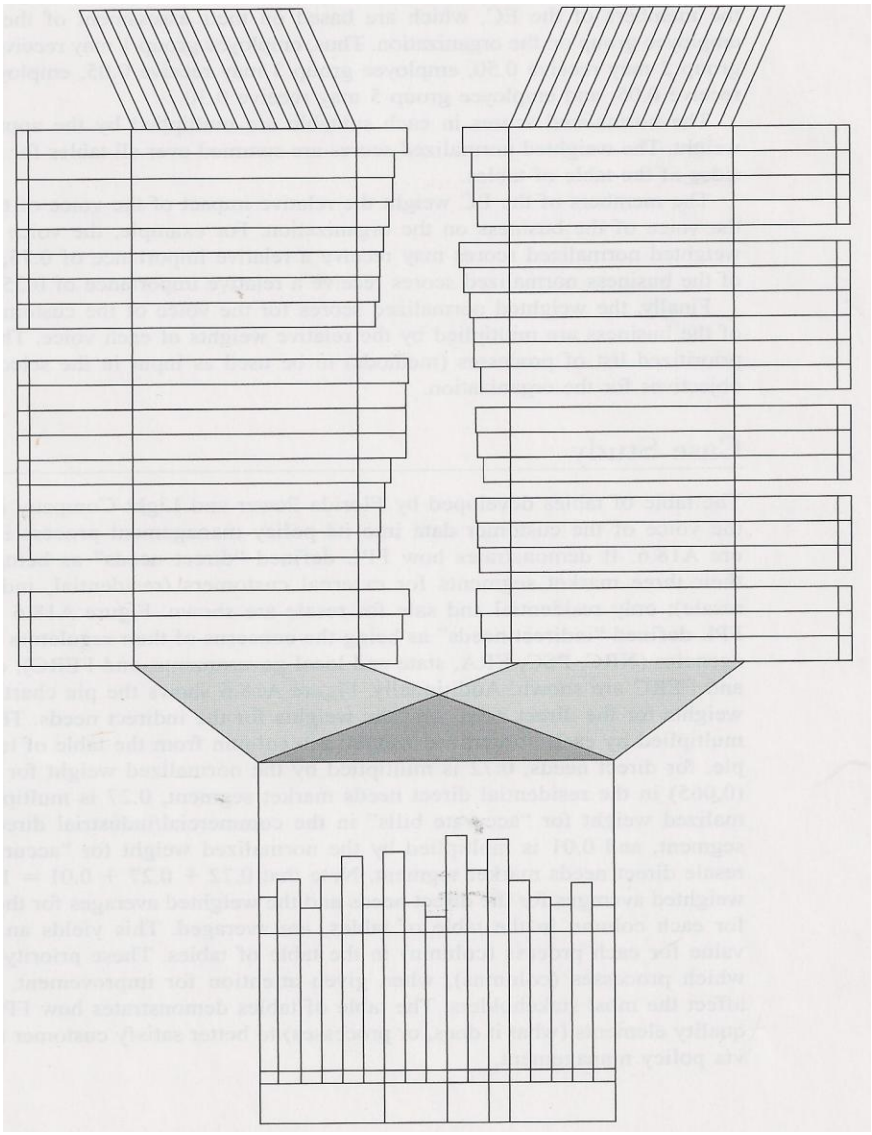
Appendix A19.3
Table of Tables

The original concept of the Table of Tables was developed by the members of the Research, Economics, and Forecasting Department of Florida Power & Light Company. The Table of Tables presented here is a variant of that. It considers customer requirements and employee requirements, and creates one prioritized list of processes (methods) to be highlighted for attention in the strategic objectives of the organization [Lawton, 2002, p.3].

Building a Table of Tables

A graphic mock-up of a Table of Tables is shown in Figure A19.5 [FP&L, Research, Economics, and Forecasting Department, 1990, p. 3].

Figure A19.5
Generic Table of Tables



Note that the three Voice of the Customer sub-tables on the left side of the Table of Tables in Figure A19.5 and the five Voice of the Business sub-tables shown on the right side of the Table of Tables in

Figure A19.5 share a common set of processes (methods) in their columns. The Voice of the Customer and Voice of the Business studies all result in prioritized lists of the common set of processes. The Table of Tables globally prioritizes the common processes from each subtable.

The group of staff employees selected by the EC establishes a weight for the process priorities from each direct and indirect customer group, or subtable, in the Voice of the Customer analysis and a similar weight for each employee group in the Voice of the Business analysis. As an illustration, each of the three customer groups on the left side of Figure A19.5 could receive equal weights of 0.333, 0.333, and 0.333, while the five employee groups on the right side of Figure A19.5 could receive weights determined by the members of the EC, which are based on their assessment of the impact of each employee group on the organization. Thus, employee group 1 may receive 0.10, employee group 2 may receive 0.50, employee group 3 may receive 0.05, employee group 4 may receive 0.05, and employee group 5 may receive 0.30. The weights on both the right and left sides of figure A18.5 must add up to 1.00, with the exception of rounding error.

The normalized scores in each sub-table are multiplied by the appropriate subtable weight. The weighted normalized scores are summed over all tables for the left and right sides of the Table of Tables.

The members of the EC weight the relative impact of the Voice of the Customer and the Voice of the Business on the organization. For example, the Voice of the Customer weighted normalized scores may receive a relative importance of 0.75, while the Voice of the Business normalized scores receive a relative importance of 0.25.

Finally, the weighted normalized scores for the Voice of the Customer and the Voice of the Business are multiplied by the relative weights of each voice. This results in one prioritized list of processes (methods) to be used as input in the selection of strategic objectives for the organization.

Case Study

The Table of Tables developed by Florida Power & Light Company in 1988 to input the Voice of the Customer data into their policy management process is shown in Figure A19.6. It demonstrates how FPL defined “direct needs” as being the desires of their three market segments for external customers (residential, industrial, sale for resale); only residential and sale for resale are shown. Figure A19.6 also shows how FPL defined “indirect needs” as being the concerns of their regulators and government agencies (NRC, PSC, ERA, State and Local governments, and the FERC); only NRC, PSC, and FERC are shown. Additionally, Figure A19.6 shows the pie charts containing the weights for the direct needs and the weights for the indirect needs. These weights are multiplied by each normalized weight in a column from the Table of Tables. For example, for direct needs, 0.72 is multiplied by the normalized weight for “Accurate Bills” (0.065) in the Residential direct needs market segment, 0.27 is multiplied by the normalized weight for “Accurate Bills” in the Commercial/Industrial direct needs market segment, and 0.01 is multiplied by the normalized weight for “Accurate Bills” in the Resale direct needs market segment. Note: 0.72+0.27+0.01 = 1.00. Finally, the weighted averages for the direct needs and the weighted averages for the indirect needs, for each column in the Table of Tables, are averaged. This yields an overall priority values for each process (column) in the Table of Tables. These priority values indicate which processes (columns), when improved will maximally affect the most stakeholders. The Table of Tables demonstrates how FPL prioritized its quality elements (what it does, or processes) to better satisfy customer needs and wants via policy management.

Figure A19.6
Customer Needs Table of Tables

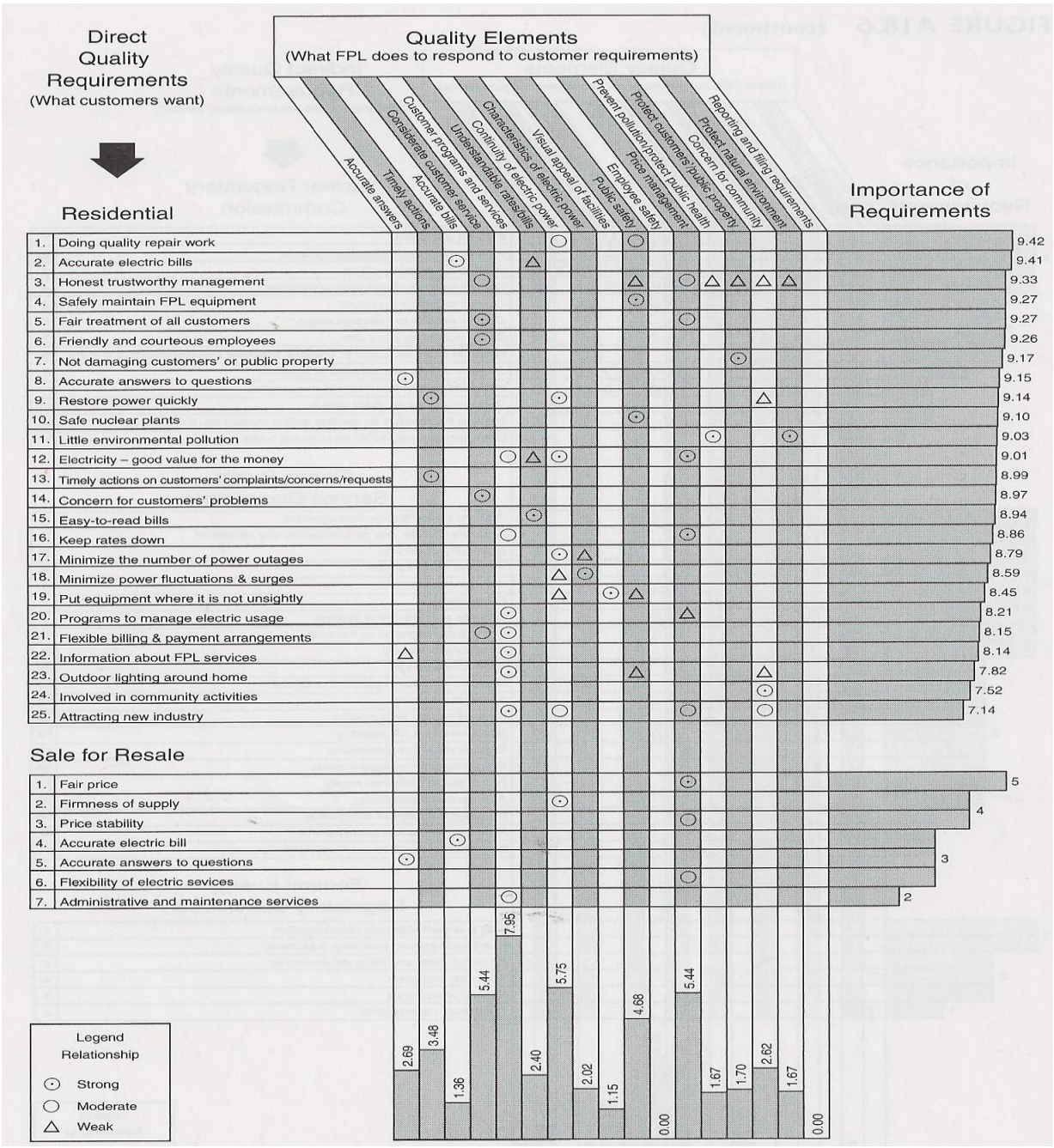
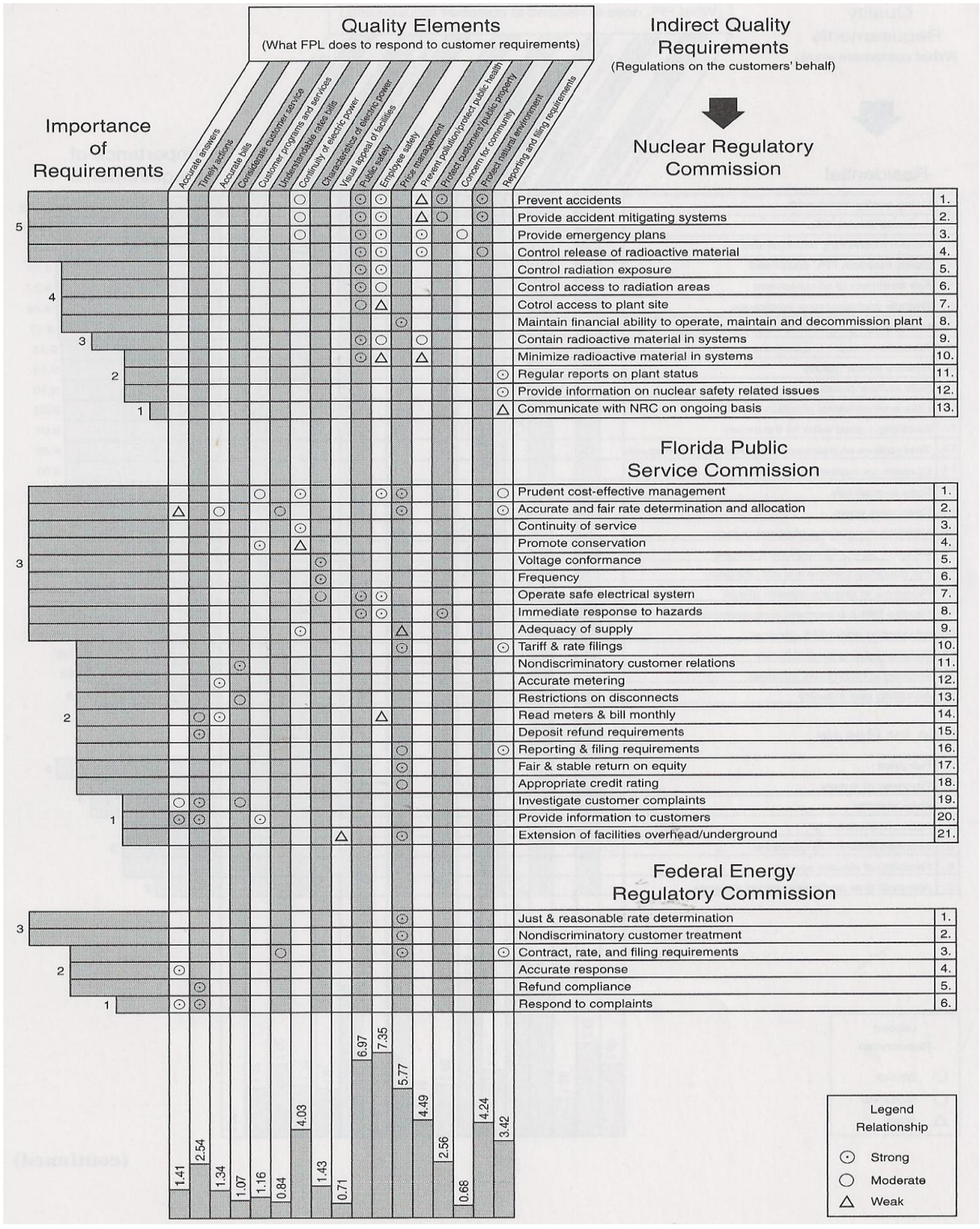
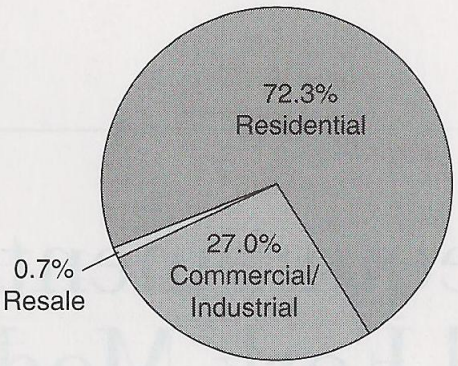


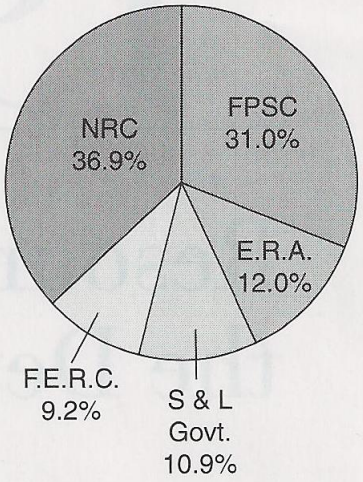
Figure A19.6 (continued)



Weighting of
Direct Needs



Weighting of
Indirect Needs



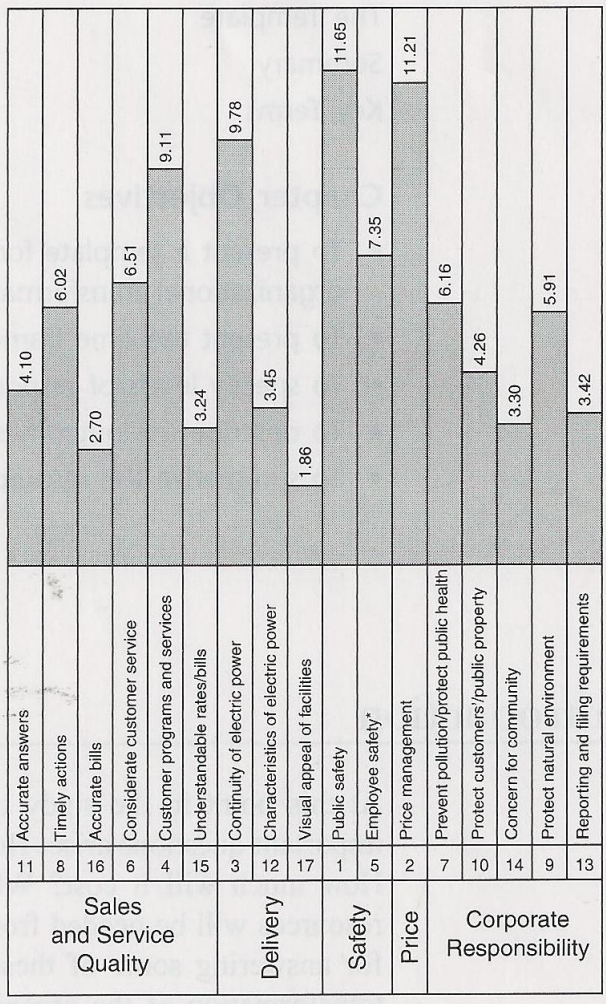
NOTES
Importance of Requirements

1. Residential and Commercial/Industrial: Mean rating (scale of 1–10) of customers responding to Importance Survey.
2. Resale: 1–5 rating based on analysis by functional staff.
3. NRC, ERA: 1–5 scale based on consequence of noncompliance.
4. FPSC, Gov't, and FERC: 1–3 scale based on consequence of noncompliance.

The Table of Tables represents FPL's customers' needs and their importance ratings of these needs. It does not represent the Company's ranking of functional areas.

*Employee Safety is one of management's highest priorities; its importance is in no way diminished by its ranking from the customer needs perspective.

Overall Ranking of
Corporate Quality
Elements



FPL