# Building a Quality Improvement Program at Florida Power & Light

*One of the great things about quality is that you don't have to sell it to your customers. All you have to do is produce it; the rest takes care of itself.*

Florida Power & Light Company (FPL) is fast becoming recognized as a leading company in quality management—perhaps *the* leading American company. Xerox has viewed FPL as the U.S. benchmark in quality practices. In 1986 FPL won the electric industry's coveted Edison Award in recognition of its Quality Improvement Program. Last year Chairman John Hudiburg was a major advocate of legislation creating the Malcolm Baldrige National Quality Award.

The Quality Improvement Program (QIP) originated in 1981. It grew out of FPL's problems experienced in the late 1970s. Fuel costs were rising, inflation was soaring, heavy capital expenditures seemed inevitable, and at the same time knowledgeable customers were demanding reliable service at low cost. The good old days of building bigger plants and selling cheaper power were gone. The situation was similar to that faced by many manufacturers.

At that time, a bright spot at FPL was the quality assurance process for constructing the St. Lucie Nuclear Power Plant. (Later, in 1983, St. Lucie No. 2 actually finished under budget and ahead of schedule—amazing in an era of financial disasters in building nuclear power plants. Savings, including cost avoidance, amounted to about $600 million.)

Determined to expand this quality performance, then-President Marshall McDonald visited Japan. He came away impressed, and other FPL employees at all levels began to make the same pilgrimage. They proceeded to develop the three major components of the Quality Improvement Program in three phases:

1. Quality Improvement Teams (1982)
2. Policy Deployment (1984)
3. Quality in Daily Work (1986).

In 1988, more than 1500 FPL Quality Improvement (QI) teams, consisting of 10,300 employees (70 percent participation rate) are at work. Hundreds of employees are engaged in projects specifically designed to achieve the objectives set forth in Policy Deployment. Every

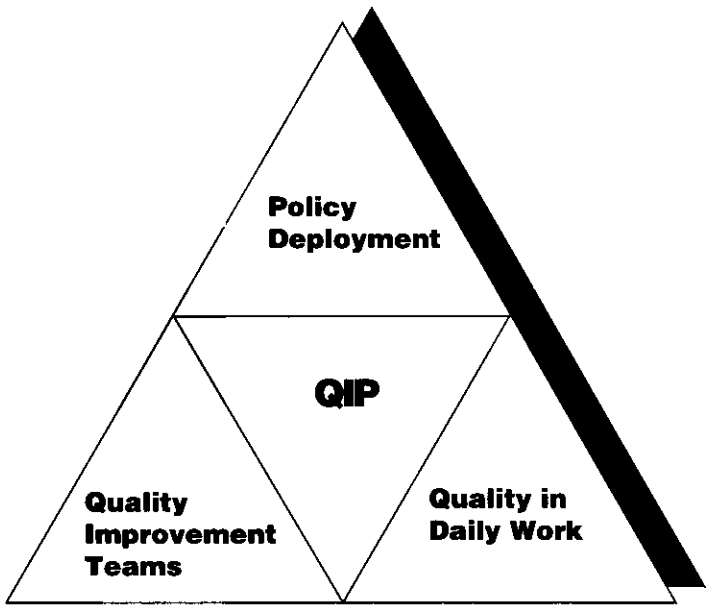



***Fig. 1.***

***Florida Power & Light's Quality Improvement ProgramTriangle:***

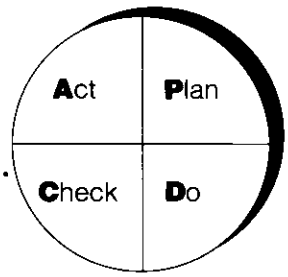
- *Policy Deployment—Management prioritizes and reviews organizational problem solving.*
- *Quality Improvement Teams—Employees engage in selected problem solving.*
- *Quality in Daily Work—Each employee applies the Plan-Do-Check-Act cycle to all activities necessary to meet the needs of all customers, both external and internal.*

## Four Principles of Quality Underlie FPL's QIP

1. **Customer satisfaction.**
   Quality is satisfying the customer. Satisfying the customer means meeting their needs and reasonable expectations. Beyond that it means having an attitude that puts the customer first. (For example, a phone call from someone who uses one of my products is not an interruption from my work. It is my work.)

2. **PDCA.**
   Plan-Do-Check-Act, sometimes known as the Deming Circle. This is a four-phase philosophy for working and problem solving that is embedded everywhere in FPL's QIP processes

   **Plan** what to do.
   **Do** it.
   **Check** results.
   **Act** to prevent future error or to improve the process.




3. **Management by fact.**
   (Often referred to as "speaking with facts.") This has two meanings not only for managers, but for all employees: First, collect objective data. Second, manage according to this data.

4. **Respect for people.**
   This principle assumes that all employees have a capacity for self-motivation and for creative thought. Each employee needs to listen to, and support, this capacity in every other employee.

*Fig. 2.*

employee, regardless of degree of involvement in the first two phases, has been introduced to the concept of Quality in Daily Work.

After investigating the masses of quality information, FPL found that no one had attempted to tailor an electric utility quality program of the scope desired. To craft its own program, FPL drew on all the well-known names: Deming, Juran, Gunneson, and Crosby, plus numerous Japanese experts. Not the least of FPL's accomplishments is developing a broad, cohesive program from bits and pieces of quality lore.

By 1988, QIP is close to being an integral part of FPL's corporate culture. Overall direction is guided by a corporate Quality Council, which includes FPL's top officers. A development team assists the Quality Council with top level QIP development and maintenance. The Quality Improvement Department pushes, supports, facilitates, and tracks quality processes for the entire FPL organization. These organizational appendages indicate that FPL is still working on its cultural metamorphosis, but FPL managers can now sense that QIP is becoming the way FPL "automatically" does business.

Such a major change in corporate behavior cannot be accomplished overnight. It took about five years just to fully "introduce" the program, although that is only the beginning of a never-ending process. QIP is built on the principles shown in Fig. 2.

### Quality Improvement Teams

Within FPL they have become known simply as "QI teams," or just "teams." Their function is similar to that of quality circles. The purposes of the teams are to develop the skills, abilities, and attitudes of the team members as well as to improve the quality of FPL's services.

There are four kinds of teams:

1. *Functional team:* Usually a natural work unit, and all volunteers.
2. *Cross-functional team:* Formed to address problems that cut across organizational boundaries.
3. *Task team:* Members are appointed from one or more organizational units to work on a specific problem. When the problem is solved, the team is disbanded.
4. *Lead team:* These teams are headed by a vice president, staff

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manager, plant manager, or other manager as appropriate. These teams serve as steering committees for the activities of the teams operating in their areas. They determine how team members are selected, and establish frequency and duration of team meetings. One hour per week is average.

Facilitators coach team leaders. They communicate and coordinate the QIP efforts between teams and functional units—and handle all other duties generally associated with facilitators of quality circles.

In addition, FPL has a quality information clearinghouse known as Information Central. This clearinghouse keeps the files on team membership and their Quality Improvement (QI) stories. It processes and communicates Improvement Action Memorandums resulting from team activities, and assists with team evaluation processes.

Information Central coordinates lead team and corporate recognition activities. With 1500 teams, FPL is festooned with recognition materials, and the process of providing recognition materials and occasions is a management task in itself.

Teams normally focus on problems falling within their own work areas. An issue falling outside that scope should be "bubbled up" to lead teams, which often appoint a task team to look into it. Supervisors may be team leaders, but typically they are not. Supervisors are usually facilitators, and they are encouraged to support the teams.

However, functional teams select their own topics (called themes) to study. (Task teams work on assigned topics.) A brainstorm list of topics may be narrowed to four or five themes by a process called "multivoting," a system of group voting which quickly winnows out the preferred themes. Themes to study are selected based on 1) Whether it impacts the customer and 2) The team's judgment on whether a condition needs improving.

Some topics are off limits to the teams:

- The union agreement. (Part of FPL's workforce is organized by the International Brotherhood of Electrical Workers.)
- Safety rules from a joint safety committee—except for discussion of how-to-follow rules or how to better do a job right the first time, which reduces chances of injury.
- Absenteeism, pay, salaries, and promotions
- The apprenticeship program.

Teams present their proposals to the level of management which can either authorize action or explain why the solution cannot be implemented. In 1987 FPL's Teams submitted 942 QI stories. Most proposals have been accepted. The top team selected from FPL's 1987 recognition cycles was from the Ft. Myers power plant. Its story involved power load restrictions caused by silica contamination. The team drew a standing-room-only crowd for its presentation at a quality conference in Tokyo last November.

That is only one of hundreds of QI team stories. One prize-winning team determined how to reduce the number of checks "bounced" by customers. After 19 weeks of implementing its solution, another collections department team reduced by 85 percent the number of collection disconnects made in error. (It is hard to get closer than that to the core of customer satisfaction.)

A team at St. Augustine investigated why power line switches installed near salt spray areas were failing. The cause was corrosion of galvanized metal in the switches. By using bronze or stainless steel switches, FPL saved $40,000 per year while also improving reliability of service.

One of the QI team stories involves the problem of farmers having to reprime irrigation pumps after the shortest of service interrupts. Thirty days after tackling the problem, the team had devised a prototype "automatic prime check restart pump controller." It is in field test now. This team was the first to work

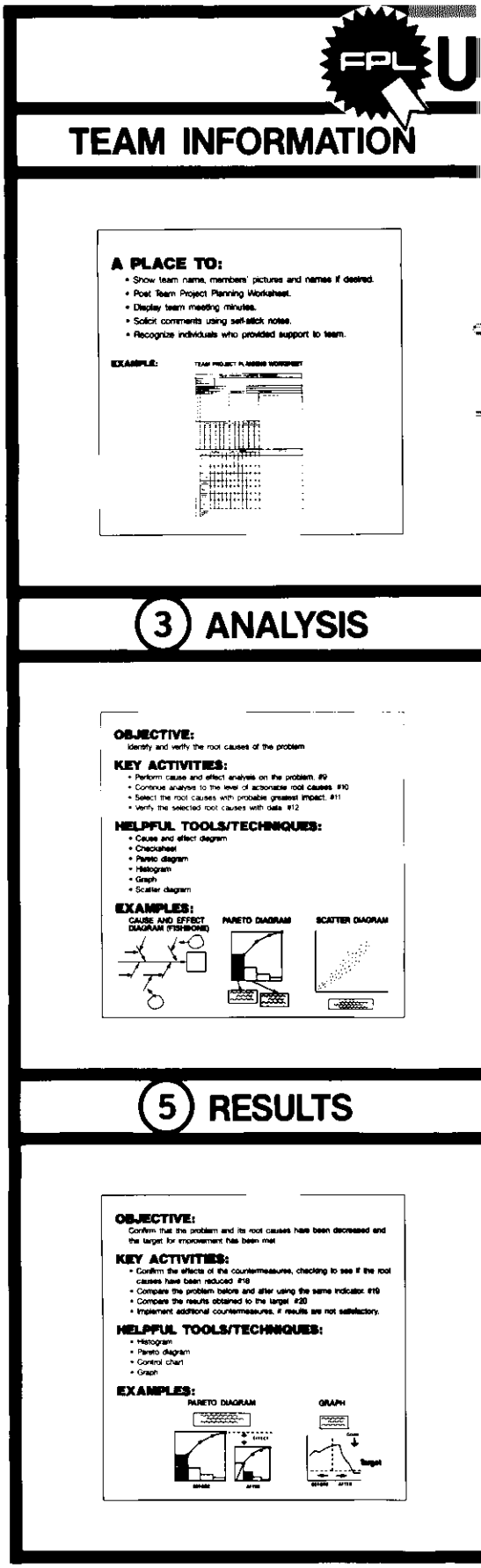



*Fig. 3. Copyright* Florida Power & Light Company.

# ALITY IMPROVEMENT STORY

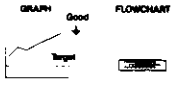
## 1 REASON FOR IMPROVEMENT

**OBJECTIVE:**
Identify a theme (problem area) and the reason for working on it.

**KEY ACTIVITIES:**
- Research for themes:
  - Review departmental indicators.
  - Survey internal/external customers.
  - Interview individuals from the work area.
- Consider customer needs to help select the theme. #1
- Set indicator to track the theme. #2
- Determine how much improvement is needed. #3
- Show impact of the theme.
- Schedule the QI Story activities. #4
- Describe the procedure used in the problem area.

**HELPFUL TOOLS/TECHNIQUES:**
- Graph
- Control chart
- Process flowchart
- Control system

**EXAMPLES:**



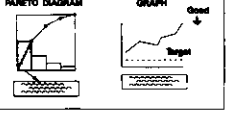

## 2 CURRENT SITUATION

**OBJECTIVE:**
Select a problem and set a target for improvement.

**KEY ACTIVITIES:**
- Collect data on all aspects of the theme.
- Stratify the theme from various viewpoints. #5
- Select a problem from the stratification of the theme.
- Identify the customer's valid requirements. #6
- Write a clear problem statement. #7
- Utilize the data to establish the target. #8

**HELPFUL TOOLS/TECHNIQUES:**
- Checksheet
- Histogram
- Pareto diagram
- Control chart
- Graph

**EXAMPLES:**




## 4 COUNTERMEASURES

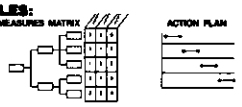
**OBJECTIVE:**
Plan and implement countermeasures that will correct the root causes of the problem.

**KEY ACTIVITIES:**
- Develop and evaluate potential countermeasures which:
  - Attack verified root causes. #13
  - Meet customers' valid requirements. #14
  - Prove to be cost beneficial. #15

  Develop an action plan that:
  - Answers who, what, when, where and how. #16
  - Reflects the barriers and aids needed for success. #17
- Obtain cooperation and approvals.
- Implement countermeasures.

**HELPFUL TOOLS/TECHNIQUES:**
- Cost benefit analysis
- Countermeasures matrix
- Barriers and aids
- Action plan
- Structure tree

**EXAMPLES:**




## 6 STANDARDIZATION

**OBJECTIVE:**
Prevent the problem and its root causes from recurring.

**KEY ACTIVITIES:**
- Assure that countermeasures become part of daily work. #21
  - Create/revise the work process.
  - Create/revise standards.
- Train employees on revised process and/or standards and explain need.
- Establish periodic checks with assigned responsibilities to monitor countermeasures. #22
- Consider areas for replication. #23

**HELPFUL TOOLS/TECHNIQUES:**
- Control system
- Control chart
- Graph
- Procedure
- Training

**EXAMPLES:**

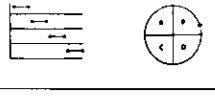

## 7 FUTURE PLANS

**OBJECTIVE:**
Plan what to do about any remaining problems and evaluate the team's effectiveness.

**KEY ACTIVITIES:**
- Analyze and evaluate any remaining problems. #24
- Plan further actions if necessary.
- Review lessons learned related to problem solving skills and group dynamics (Team effectiveness): #25
  - What was done well.
  - What could be improved.
  - What could be done differently.

**HELPFUL TOOLS/TECHNIQUES:**
- Action plan
- P D C A

**EXAMPLES:**



## 1988-1989 Policy Deployment Process

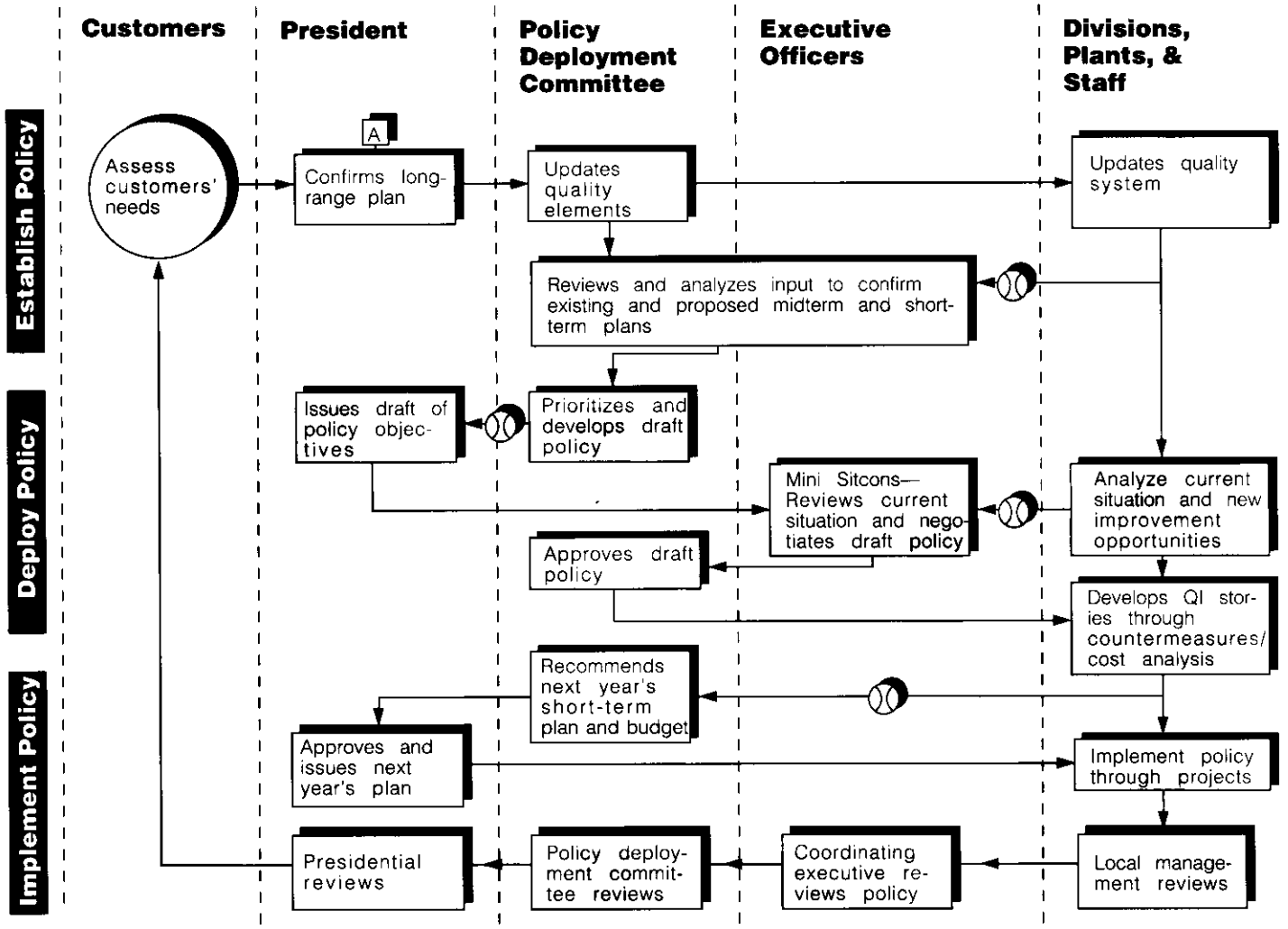



*Fig. 4.*

directly with customers on a problem on the customer side of the meter.

### The Quality Improvement (QI) Story

Every QI team functions by using the seven-step QI story approach shown in Fig. 3. It is similar to the storyboard approach used by many companies, but is unusually rigorous. This methodology is general, but useful for any scope problem —from hurricane contingency to ordering lunch.

Training for participation in QI teams concentrates on the QI story and the analysis techniques that support it, and also emphasizes meeting skills and respect for people necessary to work as teams. The value of this training began by enhancing the capabilities of the employees even before QI improvement stories began rolling in.

### Policy Deployment

Policy Deployment is FPL's overall corporate improvement process. Many corporations have a strategic planning process. FPL does strategic planning through Policy Deployment so that quality goals and quality activities at all levels support the corporate vision. All the problem-solving effort by departments, individuals, and QI teams should head roughly in the same direction.

The intent of Policy Deployment is to do more than plan strategy with a quality twist. By concentrating company resources—the power of the people—on a few priority issues, FPL targets *breakthrough* objectives in performance. The company expects to operate at levels of performance well above the average utility as a means of addressing some of its most pressing problems. One of FPL's ambitions: to be recognized as the best-managed electric utility in the United States.

Five of the objectives deployed as policy in 1987 were:

- Improve public confidence in safety programs.
- Reduce the number of complaints to the Florida Public Service Commission.
- Improve the reliability of electric service.
- Continue to emphasize safe, reliable, and efficient operation of nuclear plants (vital for keeping rates down).
- Strengthen fossil unit reliability, availability, and maintainability

targets and develop programs that achieve those targets.

By 1988 the last objective had evolved into the Reliability Availability Management Plan (RAMP), now in the second year of an eight-year process. The current objective is to increase fossil plant availability to about 95 percent of total time by 1992. (To understand how ambitious this project is, consider that a 1987 survey showed the average availability of all U.S. fossil fuel generating plants was 71 percent, and FPL recently has been running close to 90 percent.) FPL has been close to 95 percent before. Now the company must both attain this goal and hold it.

This policy is important to avoid capital expense for new generating plants, which is very important in fast-growing south Florida. Cost per kilowatt-hour to operate the plants decreases too—more electricity for the same fixed expense. In total, the cost avoidance to FPL customers might be in the range of $800 million to $1 billion by the year 2002. Besides, finding locations for new power plants has become a "royal pain."

The strategic issues which led to RAMP run deep in the electric industry. In the late '70s many utilities overbuilt capacity just when fuel costs and conservation leveled off the rise in demand for power, so ratepayers had to support expensive-but-unnecessary capacity. Other utilities have had new generating plants abort, thus putting them in the reverse bind: seeking to buy power from other utilities while suppressing both peak-load and average-load demand from their own ratepayers.

One prescription for the industry is deregulation so that more power is bought and sold over the grid network. Buyers and sellers could include more and more large manufacturers as cogenerators. Almost lost in the public discussion is quality—the possibility of deteriorating service if marginally reliable generating sources running close to capacity start switching huge amounts of power over marginally reliable grids. Assuring reliable service at a reasonable cost is one of FPL's major concerns for the future.

Through Policy Deployment, FPL attacked this strategic issue by stating it for everyone to incorporate into their QIP thinking. All employees in a position to help are asked to find ways of improving the availability of FPL's fossil plants. FPL is betting that hundreds of small improvement ideas will over time add up to a breakthrough in reliability performance. FPL's fossil fuel plants average 30 years in age.

This year the RAMP policy, plus 12 others were distributed to all FPL employees through the "1988 Guide to Corporate Excellence." This publication folds out into a wall chart. Hung in offices throughout FPL, it reminds one and all to check whether their QI team themes and daily work are contributing to the corporate vision.

Though FPL's corporate vision is guided from the top, it is not passed down from the Miami corporate office without input from around the company. Policy Deployment is a process involving everyone in management. The strategic planning and feedback process is shown in Fig. 4. Note the organizational deployment across the top of this figure. The "baseballs" represent "catch ball" negotiations in developing policy. The Policy Deployment planning and feedback process is systematic and thorough.

In addition to stimulating performance improvement, Policy Deployment has other benefits:

- Communication of company and departmental direction has become part of the normal routine.
- Horizontal communication throughout FPL has improved.
- Perhaps best of all, there is broad participation in company planning. Note that in Fig. 4 the development of policy spreads horizontally through FPL.

**Quality in Daily Work (QIDW)**

Quality in Daily Work is simply the application of PDCA (Plan-Do-Check-Act) to each individual's job, thus systematically improving the job, the product, and the services produced. This is probably the most difficult of the three components of FPL's Quality Improvement Program because it affects every employee within FPL and it calls on many of the same skills necessary for QI teamwork and for Policy Deployment. It also gets to the heart of quality improvement.

The objectives of QIDW are to maintain gains made in improvement projects, to become more consistent in operating results, to clarify individual contributions to customer satisfaction, and to incrementally improve daily operations.

A simple way to describe QIDW is to first stabilize a work process so the quality of the output is in control.

**The purpose of QIDW—daily application of the Plan-Do-Check-Act cycle—is meeting customers' needs and reasonable expectations. Customers are not only ratepayers, but fellow FPL employees in other departments.**

Then apply the Plan-Do-Check-Act cycle to improve the work. The next step is standardization. The improved, standardized work process is reviewed for application in other work units when possible. (FPL calls this replication.) QIDW with replication deploys quality improvements throughout FPL. A more extensive explanation of the QIDW process is diagrammed in Fig. 6.

The purpose of QIDW—daily application of the Plan-Do-Check-Act cycle—is meeting customers' needs and reasonable expectations. Customers are not only ratepayers, but fellow FPL employees in other departments. A customer orientation is necessary to practice QIDW. Each individual and each group must identify customers, both internal and external, determine customers' real needs, and improve customer service. The basic concept is simple. Learning how to actually do it is not quite as simple. QIDW is a process that is never "completely implemented."

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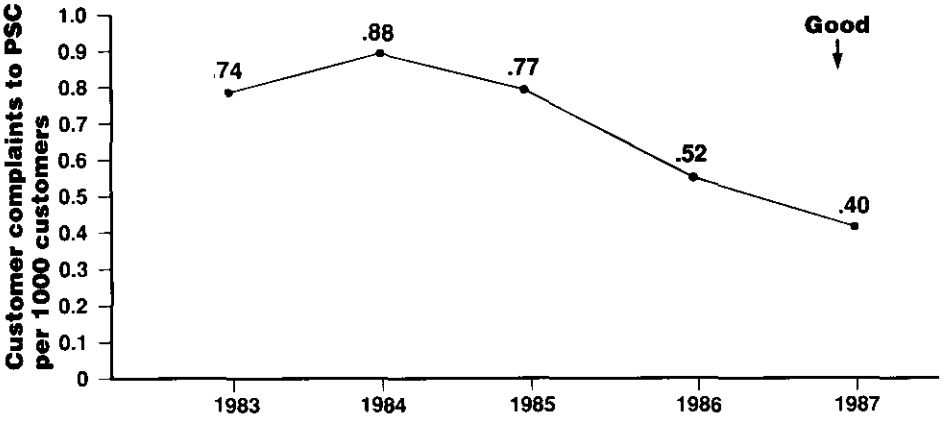
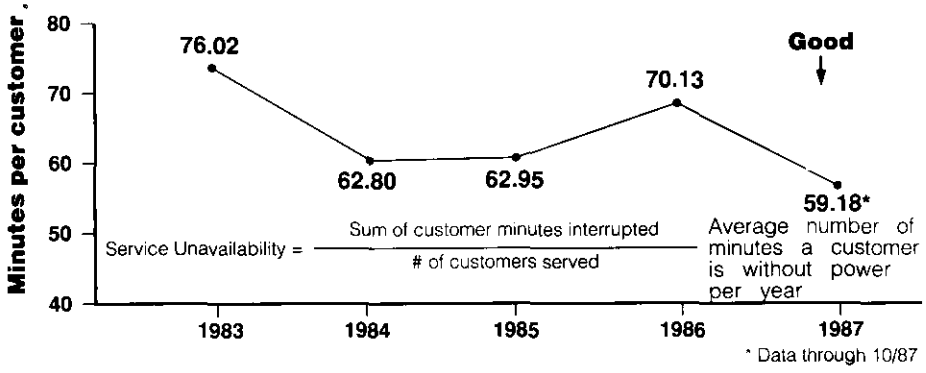
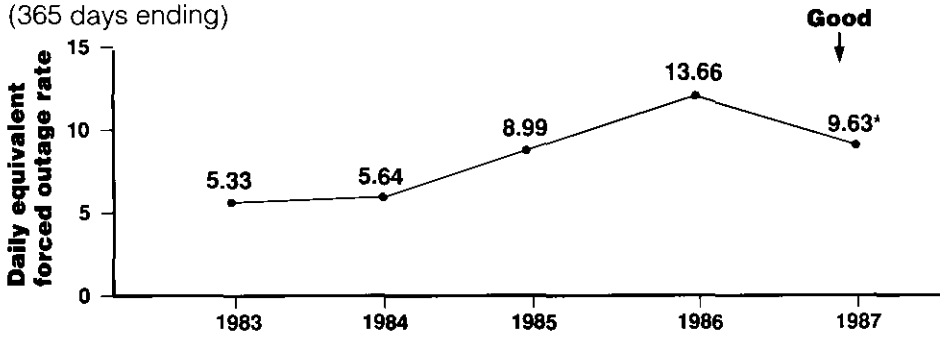
**PSC Complaints per 1000 Customers Systemwide**
(excluding current diversion) (12 months ending)




**Divisions Total Service Unavailability**
(12 months ending)




**Daily Forced Outage Rate (Fossil System)**
(365 days ending)




* For example, during 1987, forced or partially forced outages caused FPL's fossil system to be out of service 9.63 percent of the time it should have been required to operate.

***Fig. 5.*** *Some status indicators of FPL's progress toward deployed policy objectives. Progress is not a constant, assured result. The company must be persistent.*

One QIDW result comes from the Coral Gables District meter readers. They knew of many practical ways to cut meter reading errors, but had to implement their solutions. Through QIDW their reading errors dropped by 50 percent in a year.

### Vendor Commitment

Over $2 billion per year, or about 60 percent of FPL's revenues, procures products and services from vendors. The quality of vendor performance is obviously critical to FPL's quality. In 1986 FPL launched a "partners in quality" program, now known as VQIP. The foundation of the program is a new procurement policy.

Under the new procurement policy, buying decisions are based on four key performance factors: 1) quality, 2) safety, 3) timely delivery, and 4) life-cycle costs. Life-cycle cost is defined as the total cost of ownership—not just initial acquisition cost—but also costs of failure, maintenance, repair, personnel, and other costs of a vendor inadequately meeting specified needs. The policy was originally designed to benefit FPL's ratepayers, but it also offers FPL's vendors a "return" by departing from doing business on cost alone.

FPL is busy with vendor education, and busy identifying purchase specifications that relate to reliability of service. FPL, as with most companies striving for excellence, is reducing its vendor base and forming long-term relationships with its most reliable suppliers. Long-run, the objective is to have QIP extend as far as possible into the relationship with vendors.

### Commitment to the Quality Improvement Program

FPL refers to the Quality Improvement Program as a journey, not a destination, so the company has not "arrived," nor does it expect to. Since QIP is really a new way of doing business, the dedication to continue the journey must be profound. At FPL that dedication begins with the board and the CEO, but that is not enough. It is an enormous, consuming effort to continue the momentum until it involves every employee (if that is possible).

## Quality In Daily Work: Steps and Explanations

Reach consensus with your boss and others on your top priority job. That is the first QIDW step to making your work more effective.

This will allow you to design your QIDW effort to truly help the company run well

Locate the individuals or groups that receive and use your outputs. This will help you see how your work will satisfy their needs and reasonable expectations

Indicators allow you to check whether you are on target. Then you can take corrective action when needed.

LImits let you know exactly when the situation is unsatisfactory, or needs countermeasures.

Describe (or devise) the relevant process and a system of control points to assure proper running.

Actually use the system.

If results are unsatisfactory, take countermeasures.

If the processs yields desirable results, make it a standard part of departmental procedure.

If the process functions at its capacity, but results exceed limits, reevaluate limits.

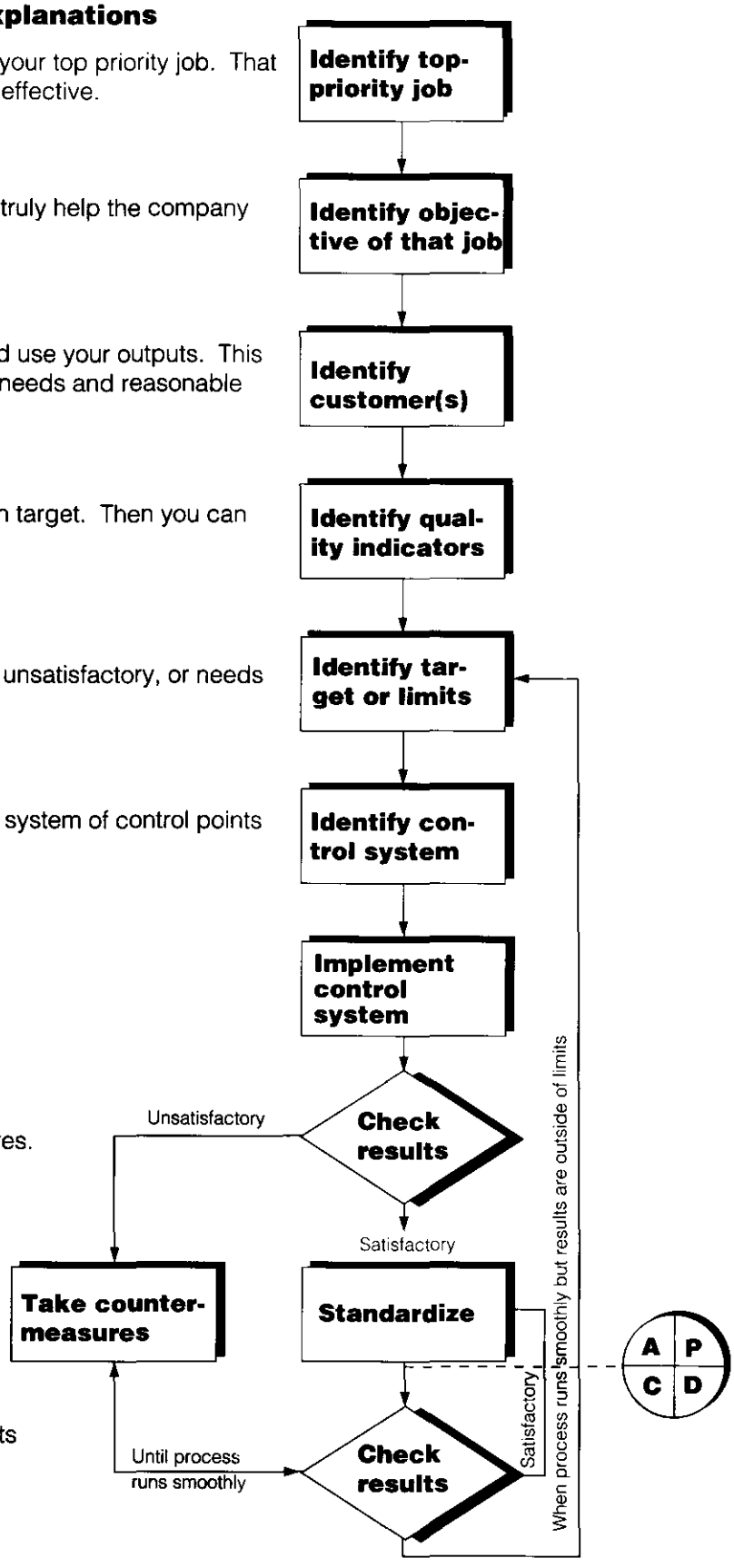



*Fig. 6.*

## On Doing Common Things with Uncommon Quality

One of the tendencies of human nature is to link personalities with the dramatic or decisive events associated with them—Wellington and the Battle of Waterloo, Churchill and the Battle of Britain, Lincoln and the Emancipation Proclamation. Most of us feel that we could summon the mental or physical resources necessary to face such momentous occasions as these.

But most of us also feel that it would be difficult to summon those same resources to face occasions that aren't so momentous. How many New Year's resolutions still exist on February 1st? How many times have the same 10 pounds been lost?

Companies have personalities because companies are made up of people. And the people of FPL have faced their share of momentous occasions and come away with a number of singular distinctions—bringing a natural gas pipeline to Florida; building the St. Lucie Nuclear Unit No. 2 ahead of schedule and under budget at a time when the nuclear industry was experiencing major delays and cost overruns; winning the electric utility industry's highest award, the Edison Electric Institute's prestigious Edison Award.

It is this latest recognition that focuses on our greatest accomplishment. Not the isolated feat of winning that award, but changing a course of conduct that led to that feat. And changing a course of conduct—in effect changing a corporate culture—does not generate accolades.

Our Quality Improvement Program (QIP) is our answer to the challenges and complexities of the current business scene. Its results can be dramatic and can lead to momentous occasions to be celebrated.

But "getting from here to there," the process of changing the way our people go about their everyday jobs, even changing the way they think as they approach those jobs, is a journey that will not find its way into the history books. And yet that journey is the very backbone of a change in corporate philosophy that is producing major benefits for our three major constituencies: our shareholders, our employees, and our customers.

QIP is a process—a standardized process of problem solving that can be applied regardless of the task. The process developed at Florida Power & Light Company utilizes several steps and a variety of tools and techniques designed to identify the problem, then the solution, and finally the opportunities for standardizing and replicating the solution, or applying it to other similar situations.

The journey involves the difficult task of reshaping people's thinking so that they approach their jobs with this process ingrained in their minds. This is what it takes to "get from here to there." It is a difficult journey that really never ends. And outside of internal recognition, there are no accolades along the way.

*Marshall McDonald*
President
FPL Group, Inc.
*Excerpt from 1987 Annual Report*

From the board of directors to every supervisor, management must adopt the principles and language of quality, follow the processes, set examples, and guide others. A substantial commitment is necessary for employee education, and for awareness and recognition programs. These programs require reallocation of budgets and personnel.

FPL has begun advising other companies also interested in the QIP journey. While there may be some exceptions, a few useful guidelines are:

- Keep quality improvements cost effective.
- Employ existing reporting systems and remain compatible with existing organization structures as much as possible.
- Try to keep QIP compatible with management techniques already taught in the organization.
- Two ingredients are necessary to fuel QIP: employee recognition and employee satisfaction. Of the two, only recognition can be conferred. Personal satisfaction must come from responsibility—seeing that "quality begins with me." This attitude develops over time from confidence that "my ideas count, they will be given an audience, and they can affect change."
- Control should reside at the management level which can best recognize improvement opportunities and take advantage of them.
- QIP should be adaptable to different work locations and work settings.
- Set a major goal to remove barriers that prevent people from doing their job right the first time.
- Representatives at all levels of management should be involved so that they will take ownership.

In its QIP journey, FPL borrowed a number of ideas from the Japanese (some from Kansai Electric Power Company). However, one of the best quotes from an employee was inspired by Abraham Lincoln: "QIP is of the people, by the people and for the people because people aren't a company resource—they are the company." Mitch Williford, reactor control operator, St. Lucie Nuclear Plant.

*The FPL Quality Improvement Department provides an eight-hour visitor orientation in Miami on the last Tuesday of every month except December. Phone 305/552-4421.*