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Quality Circles: "Teaming Up" at the Electric Utilities

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QUALITY CIRCLES: "TEAMING UP" AT THE ELECTRIC UTILITIES

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An Abstract Presented to the Faculty of the Graduate School of Lindenwood College in Partial Fulfillment of the Requirements for the Degree of Master of Business Administration

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ABSTRACT

The focus of this project is the hypothesis that productivity of employees of utilities will improve in terms of increasing quality of their service, while controlling operating costs if they participate in teams involved in the decision-making process.

With the government taking steps to deregulate the sale of electrical energy, electric utilities will be thrown into a competitive market for the first time. Managers will find it necessary to keep quality high, while keeping rates low.

As American industry faced competition from Japan, management began to adapt the programs used by Japan to fit their own organizations. One successful program is to get employees involved in the decision-making process through work teams or quality circles.

The purpose of this paper will be to determine if a concept suitable for the manufacturing industry will have the same effect on a service industry. More particularly, by using quality circles, electric utilities can increase employee productivity, increase the quality of their service and still maintain their costs.

The changes in the utility industry has required the regulated companies to review their way of doing business. Competition and customer expectations have the utility executives concerned over productivity and quality. Quality circles are seen as the way to

increase productivity and anticipate the changes in the industry's environment.

By examining the QC programs of several different utilities, this study attempts to determine the successfulness of these types of interventions. The results show that these organizations have been rewarded with tangible and intangible benefits. Top utility officials believe that training employees in the decision-making process has ensured their company's success in the future. The findings of this study has led the writer to accept the hypothesis.

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INTRODUCTION

Growth of Electric Utilities

The development of the arc lights in the 1870's proved to be the push for commercialization of electrical power. This also prepared the way for Thomas Alva Edison's invention of the incandescent lamp. But Edison knew that the lamp by itself could not go far. He knew that in order to make the lamp feasible, that an entire electrical utility system was needed and that there must be a distribution system that could deliver electricity to homes, offices, and factories (Hazan 38).

The late 1880's was a boom period for the electric utility industry and Edison paved the way for the nation's investor owned utilities. People with capital to invest saw the exciting prospects of electricity. But these investors insisted on individual, isolated generators being built rather than large, complicated central station generators. This approach required smaller investments and assured quicker returns. In 1892, on-site generators supplied almost two-thirds of the nation's electricity (Munson 55).

Unlike today's utilities, the first generating firms did not possess monopolies over specific regions. Totally unique electrical arrangements overlapped each other. More than twenty generating

companies operated in Philadelphia alone, variously based on patents by Edison, Sawyer, Maxim, Westinghouse, Brush and others. Some companies offered power at 100, 110, 220 and 600 volts and provided frequencies of 40, 60, 66, 125 and 133 cycles. A customer moving across the street could very well find that none of his electrical appliances would work in his new home. To try to ensure some order and to protect themselves from ruinous competition, many executives tried to fix service areas and production among their different companies. The public was outraged when they learned of these attempts to secretly form monopolies. The Sherman Antitrust Act of 1890 made these efforts illegal (52).

The more effective method was to merge or consolidate. Samuel Insull, one-time personal secretary of Edison and the head of the Chicago Edison Company, was one of the first to recognize the unique characteristics of a utility system. He argued that even though an area may use 100 kilowatts of electricity for lighting, because different lamps were being turned on at different times, the total demand may only be 30 kilowatts. Insull reasoned that instead of installing individual generating units totalling 100 kilowatts, a central station supplying 30 kilowatts of power would be more efficient and economical. He saw that the diversity of demand could be used to determine economic system planning. He determined that the central station could supply cheaper electricity than the competing isolated systems.

With expansion into a variety of towns and cities, came the threat of municipalities taking over businesses which they deemed as supplying essential public services. To avoid these takeovers and political headaches, Insull devised a plan to establish state regulatory commissions, staffed by professionals independent of politics. Understanding the public's mistrust of monopolies, Insull proposed the idea of state regulation to the National Electric Light Association (NELA) in 1898. Insull's plan was for state governmental agencies to fix rates and standards of service and insure exclusive control over a territory for a single utility. Insull engendered electrical monopolies through government sanctions. By extending a previous Supreme Court ruling regarding railroads, regulators guaranteed electric companies a fair return on their investments. With an almost guaranteed profit, the electric companies now had their monopolies and the incentive to expand (Tyner 62).

Bigger systems could support bigger generating plants, which produced economies of scale. A single power plant could efficiently and economically serve rural and urban areas. This enabled the electric companies to diversify their load even further. The diversification of energy demand between areas led to more efficient use of a central station system. It was also easier and less expensive to engineer and finance one large utility than the many isolated units (Munson 55).

The savings brought about by the changes in the electrical industry were passed along to the customer. Edison's first customers paid about 25 cents per kilowatt hour for their service. By 1945, the average price per kilowatt hour was 3.4 cents and by 1969, the price had dropped to 2 cents. Utilities were the good guys. Everyone was a friend of the "light company" (Hazan 42).

If the decades of the 1940's and the 1950's were considered the golden years for the electrical utilities, then the mid 60's could be termed the "Era of Shocks". Blackouts, protests, embargoes and economic disasters shattered the utilities' momentum and basically caused the drastic turnaround for the electric companies.

Deregulation

Increasing dissatisfaction with the present system of electric utility regulation and the sense of urgency concerning the weaker condition of the industry had led the governmental agencies to search for a workable solution to try to bail out the power companies while yielding to the demands of the ratepayers. Many people feel this can be accomplished through deregulation. The general feeling is that deregulation will spawn competition, which in turn will create incentives for more efficient use of resources and for the development of new technologies and innovations.

Because of the high inflation and interest rates, the cost of new facilities has increased by a factor of seven or eight. The cost of a pre-OPEC 500 megawatt unit was about $150 per kilowatt to build. A recently completed plant was about $1,100 per kilowatt. As capital costs have risen, so have fuel costs. With increased regulations for controlling emissions and more rules dealing with safety, the government has also had a hand in raising the cost of new plants. There is no longer an economies of scale. Bigger is not better any more. This, and the fact that excess capacity can not be rolled into the ratebase has led many utilities to forego any new construction.

To fill the void between generation capacity and energy demand, the government has enacted laws to promote Independent Power Producers (IPP). These IPPs are small, individually operated power stations that use alternate fuels other than the normal fuel sources: coal, natural gas, and nuclear energy.

The Public Utility Regulatory Policies Act (PURPA) of 1978 gave rise to this group of generating companies. PURPA was enacted during the oil embargo at a time of growing awareness of the need for greater energy independence and self reliance. It was designed to encourage conservation and efficient use of resources and facilities. It was to promote cogeneration and small scale power production. To these ends, PURPA established a market for the independent power producers and cogenerators. PURPA set standards as to the size, efficiency and ownership for the generators wanting to obtain status as qualified facilities (QFs). The Act also required utilities to purchase the

power of these qualified facilities at the utility's "avoided costs". The avoided costs are costs to the utility of supplying the power itself or purchasing power from other sources. The final determination of avoided costs was left up to the state commissions (Ackerman 8).

According to the Edison Electric Institute, prior to PURPA, there was a small and declining number of non utility generators producing power in the United States. Between 1978 and 1985, qualifying facilities have installed 9,585 megawatts of generating capacity, or roughly the equivalent of ten nuclear power plants. The annual growth in generating capacity for non utility producers has run about 15%, while utilities' installed capacity has increased at an annual rate of 2.4% (LeCerf,"Facing the Critical Issues ..." 28).

Some utilities have already entered into long-term agreements to purchase generating capacity from cogenerators rather than constructing new power plants of their own. They feel that they can purchase power from these generators cheaper than they can produce it themselves. This has given rise to the IPPs as a potential, important source of power. The U.S. Energy Department projects that the non-utility generation for sale to utilities will more than double by the end of the century. Sales are projected to go from 57 billion kilowatt hours in 1988 to some 118 billion kilowatt hours by the year 2000 (LeCerf,"How Power Will ..." 24).

On March 16, 1988, the Federal Energy Regulatory Commission (FERC) issued three Notice of Proposed Rulemaking (NOPR). The intent of the three notices is to increase competition in supplying electrical energy, promote the economic efficiency in implementing PURPA and develop new generating capacities. The three topics covered by the FERC proposals are: (1) relaxed regulation of IPPs, (2) allowing states to use bidding as an alternative to administratively determining avoided costs and (3) clarifying existing PURPA regulations and determining appropriate measures of avoided costs. The general belief was that the electric utility industry had undergone fundamental changes and that regulatory authorities needed to reexamine electric utility regulations. The focus is now on greater competition, increased supply options and bidding utility's own service territory (24).

Even with PURPA and the NOPRs, there has not been the enormous increase in applications for IPPs that had been expected. The reason is a 55-year-old law called the Public Utility Holding Company Act of 1935 (Pucha). As the Act exists now, it is like a curse to IPPs. Some say that they would rather not build any power generating facilities than to become entangled in Pucha's regulations. According to Pucha, any entity that owns facilities that generates electricity for resale is defined as an electric utility company. The ownership of 10% or more of the voting stocks of such an electric utility company makes the owner a holding company. In certain situations,

this may make the utility a nonexempt holding company subject to the regulations of Pucha.

These regulations include approval by the Securities & Exchange Commission (SEC) of all financing, as well as SEC approval of transactions among affiliates, and regulation by the SEC of the capital structures of the holding companies and their affiliates. In addition, Pucha regulates how the board of directors of the holding companies are made up, it limits the companies' operation to a single, interconnected system within a single, contiguous area, and it prohibits diversification into unrelated lines of business.

Holding companies can be treated as "exempt" if their operations are confined within a single state, where they are subject to state regulation, or if they are only incidentally engaged in the generation of electricity. An aluminum company that generates and sells the surplus energy is an example. If these holding companies acquire a 5% or more interest in an IPP, they could lose their exempt status.

Steps are being taken by the Senate Energy Commission to introduce a controversial bill that would exempt IPPs from the burden of Pucha. But there has been some very intense lobbying, both for and against this bill. Even states are looking for assurances that there will be no erosion of their regulatory authority. So any changes in Pucha in the near future seems highly unlikely ("Utilities, IPP,..." 36).

Deregulation is seen as having several advantages. Some utilities feel it is cheaper to buy electricity from the small suppliers rather than build their own power stations. Since utilities will not have to tie up enormous amounts of capital to build these plants, the inward flow of cash can be diverted to upgrading existing facilities, making them more efficient.

Probably the biggest advantage of deregulation will be to the consumer. Deregulation will open up generation to the competitive markets. In the future, customers will be able to shop around for current or future electricity suppliers. A number of IPPs, as well as, subsidiaries of the electric utilities will be competing for the customer's electrical business. This will pressure power producers to build the most efficient generators and to operate at the lowest possible cost.

Deregulation is seen by some as a means to remedy the industry's current financial distress and as an instrument for improving the industry's long-term performance. As a society, we are constantly changing and the broad changes are having an effect on the electricity market. Consumers and businesses are substituting energy-efficient technologies and independent generation for the product once sold exclusively by the electric utilities. As we enter the new era of uncertainty, many utilities have responded by getting "lean and mean". Customers and investors are watching to see which utilities are in shape to respond to the changing business climate.

The Competitors

The competition in the electrical power industry can be seen from three areas: (1) utilities with surplus generating capacity, (2) cogenerators, and (3) independent power producers. Presently, the stiffest competition is in providing power for wholesale and industrial customers. These customers can use huge blocks of energy and require the least amount of capital investment per demand.

In the early 1970's, the country was experiencing rapid growth in demand for electrical power. The utilities were forecasting increases in demand form 7 to 8 percent annually. Then the oil embargo occurred causing double digit inflation and rising interest rates. Higher utilities rates plus the fact that Americans were becoming more energy conscience caused the first downward trend in peak demand since World War II. Many utilities were caught with brand new facilities and excess capacity. Then came the regulatory rulings that the costs of this excess capacity could not be figured into the ratebase. The utilities were no longer guaranteed a return on their investments. In order to keep their facilities from lying idle, these power companies began wooing the wholesale and the industrial customers with promises of rates at or below the utility's avoided costs for a specific period of time (usually five years). After this period, the customer would purchase power at the regular rate. For a large customer this could mean a savings of hundreds of thousands of dollars per year (Munson 137).

About this same time, the government began to appeal to the people about the need to become energy independent. They offered tax breaks and other incentives to businesses that installed cogeneration facilities. The government made it mandatory that regulated utilities would have to purchase any excess power generated by these companies, thereby, guaranteeing a market for their power. A cogenerator is a business that uses steam in its primary manufacturing process. By installing the proper facilities, that same steam can be used to turn a turbine, generating electricity. The cost is usually prohibitive for small customers, so normally only large industrial customers and municipalities exercise this option. The utility not only loses that source of revenue, but it must also pay for power purchased from the cogenerators at avoided costs whether the power is needed by the utility or not (Ackerman 17).

Today, the cogenerators are not a major competitor in most areas. But as utility rates continue to get higher, more and more large customers are studying this alternative. The idea is that IPPs will require less capital investment and with their guaranteed market, they offer quick returns. As the regulations are changed to favor IPPs, they will become a greater force in the competitive energy market.

The Consequences

Even with the advantages discussed previously, some utility executives can foresee a dark cloud over the horizon. When a customer stops purchasing power from the utility and instead buys from an alternate non utility source at a lower price, the customer is said to be "bypassing" the utility system. In the cost-of-service regulated utilities, bypass can mean some troubling consequences for those ratepayers that must remain customers of the regulated utility. Under federal and state regulations, customers pay for all of the utility's reasonable expenditures to provide them service, including a fair return on their investment. In return, the regulated utility is obligated to provide service to anyone requesting that service.

The problem with bypass occurs when customers stop purchasing power from the utilities. Those utilities must continue to pay for the capital investments spent to build the facilities necessary to serve the customers now bypassing the utility system. The fixed expenses for the facilities have to be paid for the customers remaining on the system. With fewer customers too spread out these fixed costs, the average rates for the remaining customers will have to go up. Generally, bypass is an option available only for a utility's larger customers. The remaining captive customers, primarily residential and small businesses, are the only ones remaining to absorb the excess costs.

Bypass may also threaten the reliability and efficiency of an existing utility system. Financially troubled utilities may find it difficult to serve the customers remaining on the system. Also, customers who bypass the utility now may find that the utility is unable to serve them at a later date if they should decide to return to the utility's system (Hulett 212).

There is also a major concern to the electric utility and its ability to continue to provide service if it must receive power and energy from private business electric generators. The utility is obligated to provide reliable, low cost energy to its customers, these IPPs do not have the same obligation. Unlike almost any other industry, the electric utility must deliver in excess of 99% reliability and service. The industry feels that with hundreds of small, inexperienced operators coming on line, this status could be seriously compromised.

Another adverse affect of reliability is the likelihood of reduced cooperation and communication among utilities. The interconnected generation and transmission systems have been possible only with the close cooperation and exchange of information among system planners and operators. Any reduced coordination of planning or operating would have a negative affect on reliability (LeCerf,"Facing the Critical Issues ..." 30).

There is also the uncertainty of how long the United States can depend on cogenerators and IPPs to supply major blocks of electricity. Electric utilities will not be allowed to build new capacity unless

the need for more power is obvious. The IPPs will be able to supply capacity up to a certain percentage of what will be needed. When that percentage gets too big and sites get too hard to find, the utilities will have to take over again.

A Proposed Solution

It will be those utilities that have the foresight to change that will be there to take over. Critics of the utility company have suggested that the only way power companies can survive is if the "old guard" executives were given their pink slips and sent into retirement. Utility officials are being seen as generally unimaginative men who have grown complacent with regulated profits. The utility fraternity abhors change (Munson 182).

But there is a new generation of executives coming up that are trying to adopt new technologies. In contrast to their elders, they are trying to minimize financial uncertainties by scaling back expenditures and building up energy alternatives. They are providing vitality and new ideas to this usually staid industry. This new generation of utility executives is struggling to survive in this era of uncertainty by preparing for the increased competition. To survive, these managers must be skilled organizers, innovative leaders and highly motivational. There are many approaches to competition and each will require the restructuring of the utility strategy.

One change due to this restructuring places a new emphasis on productivity or organizational effectiveness. A traditional definition of productivity can be expressed as a ratio between output and input. At the utility, improving productivity has meant increasing useful output while keeping the input constant or decreasing it. Productivity improvement programs employ a process that suggests that decisions be made in light of as much quantitative and objective information as can be collected. The most effective productivity improvement programs address corporate priorities, organization structures and work methods. The programs are expected to reduce expenses, improve deployment of resources, improve communications and make the organization more responsive to changes in their operating environment (Copp 46).

The magnitude of the affect of productivity improvements on the utilities and their customers can be seen in an examination of one Midwestern investor-owned utility. This utility serves the St. Louis area and has just over one million customers. In 1989, this utility incurred approximately $1.5 billion in expenses. Of this amount, 59.2% went to operations and maintenance. If productivity improvements in these areas would reduce expenditures by 2%, the utility could save over $18 million annually. This savings could be used to reduce the customers' rates or used to increase the relibility of their existing service (Union Electric 1989 Annual Report).

An area in which businesses are striving toward increased productivity is through the formation of quality assurance groups. These groups are made up of a cross section of management and labor employees. When a problem arises in production, these groups draw upon the expertise of the individuals for information. Organizations have realized that employees directly involved with the work know more about their jobs than anybody else. Employees are beginning to be viewed as a very important resource and these groups are one way to tap this resource. Members of the group have an equal say in the solution, from the highest manager to the lowest laborer. This gives the participants in the group the feeling of ownership. The individuals of the group will generally return to their work areas feeling motivated and being more productive (Blair 20).

The current concern in the U.S. with improving quality and productivity creates a generally favorable climate for quality groups. They provide a limited structure intervention that is compatible with both people- and technology-oriented organizations. However, some of the characteristics of American management may limit the ability of companies to implement and sustain quality assurance groups (22).

Quality assurance groups are working to increase productivity in unregulated industries. These same opportunities to participate in decision making are being offered to employees of regulated industries. The question is whether regulated companies, more particularly the utilities, can provide the organizational culture

that is conducive to quality circle success. This project will examine various traits of management that have been found to conducive to successful quality circles groups. The research will then focus on the organizational cultures of today's utilities to determine the likelihood of the successful implementation of these groups.

Chapter II

LITERATURE REVIEW

In terms of competition, the electric utility industry has changed more in the past few years than it has in the previous fifty years. Each utility will have to make decisions on how its operation will be affected by potential deregulation, load growth and increasing generation costs. Many are already beginning to restructure the organizations to deal with the competition. If an organization is going to be competitive, its productivity will have to be a top priority and every department will have to be competitive to justify its operation. This kind of shift in organizational thinking will be true for every division of the company (Rye 30).

Economic realities are the prime movers behind the quality obsession. Investor-owned utilities are facing increased competition from alternate sources of electricity. Utilities analyst Edward Tirello at Shearson Lehman Hutton Inc. predicts that 100 inefficient and cash-poor power companies could be forced out of business through mergers or buyouts by 1993. W. Kent Sterret, Florida Power and Light's (FP&L) quality chief feels that being competitive will be determined by the reduction of costs through quality control (Fins 95).

The most effective productivity programs will have to address corporate priorities, organization structures and work methods. These programs will be expected to reduce expenses, improve deployment of resources, improve communication and make the organization more responsive to new business opportunities or changes in the operating environment (Barthold 20).

Industries in the U.S. have been losing customers to foreign competition and they are doing something about it. American executives have realized that it is quality that gives the winning edge in the competitive marketplace. To recapture some of these customers, managers have been studying their own organizations and practices. Some observations have argued that in U.S.-owned companies, workers have been written off as unable to improve quality. To this end, managers have set the organizational climate for quality. These executives are scrutinizing one of the organizational devices widely used in Japan for several decades; quality circles (Gryna 5).

Dr. W. Edwards Deming, a statistician and management consultant, had little success in selling his total quality control concept to U.S. businesses after World War II. The world's production capability was in America and manufacturers did not care for quality improvement. So, Deming went to Japan and started selling his quality methods to that war-torn economy ("After 'Quantum Leap'..." 22).

After World War II, the world viewed products from Japan as being low priced and of even lower quality. Japanese industrialists realized that the future of their country depended upon a productive

economy. This meant producing goods of sufficient quality to compete in foreign markets.

Deming bases his concepts on the theory that all processes experience variations that are likely to reduce quality. Therefore, any system is only as good as management's ability to see and control these variations. According to Deming, management must make certain: (1) quality is built into all processes, (2) teamwork is fostered and barriers between departments are dissolved, (3) quality in daily work is encouraged, and (4) companywide policies drive the entire process. Deming feels that a company should not work on costs, but rather they should work to improve quality. This, he says, will lower costs and ultimately affect the price of the product ("The Fear That..." 24).

In today's economy, the key to gaining and sustaining a competitive position is achieving high-quality products and services that satisfy customers. Businesses know what quality generates: pride, the satisfaction that comes from a job well done; productivity, time saved when things are done right the first time; and profit, which results when customers equate a company with quality. The Residential Customer Market Segmentation Study sponsored by the Edison Electric Institute in 1985 revealed that residential customers think of electric companies in two discrete ways: as a product institution and as a service institution. Utilities have to ensure not only the quality of their products, but also the quality of their services (Bemowski 45).

For many years, utilities had perceived themselves as suppliers of products. But from their customers' perspective, the utilities also provide a service. From the standpoint of providing quality service, the most important job is to satisfy the reasonable needs and expectations of the customer (46). Ronald C. Kuether, Senior Vice President, The Kansas Power & Light Company, states that in reality, the utilities today market their services; the continuity and quality of their electrical power and energy. It is how this service is perceived by the customers that will determine the success of the utility ("About the Issues..." 46).

The challenge is making a manufacturing concept work for services. A manufacturer has a real product whose quality can be standardized by measuring and testing. Unlike the traditional product-oriented manufacturer, a service-oriented industry cannot quantify the quality of its product. Therefore, the measure of quality in the utility is making products that meet their customers' expectations. And customers aren't just the people who buy a company's product. They are the people on both sides of the transaction-inside and outside the company (Jacobson 71-2).

The concept of quality training is not a new idea, it has been going on since the mid 60's in the United States. But in this country, traditionally, quality control had been a separate corporate function performed by specialists in different departments. By contrast, the total quality programs involve every corporate function, cover both products and services, and are considered a basic business

of management. In Japan, for example, training included seminars for top executives, as well as for upper- and middle-management. Foremen were also included in the training. Management decided to train the workers on a voluntary basis. The workers were usually seated around a table, thus the term "circle". The result was the quality circle concept that included problem selection, analysis, and solution (Gryna 11).

Quality circles (QCs) involve a shift in the center of control of an organization from external to internal. They recognize that groups and individuals directly involved in the work possess the greatest capacity to assess the many aspects of quality and productivity. They also assume that groups and individuals, given the opportunity and the appropriate training, will exercise self-control and responsibility. These assumptions have been substantially supported by behavior research, especially in situations where appropriate accountability is involved (Blair 20).

Joe Collier, Jr., President and CEO of Central Maine Power is involved with that utility's activities in quality circles. His experience with the quality-control ethic has convinced him that the employees' ideas must always get a hearing and, in the process, the employees become part of the solution that is required to solve a problem ("Projects of the 1990s..." 57).

For example, at FP&L, linemen lay plastic pipe into which the cable pullers had to install electrical wiring. These pipes often slipped out of position and the cable pullers would then be delayed in performing their job. Qualitatively speaking, the customer's expectations were not being met. So the linemen designed and built a template that would hold these pipes in place and save the cable pullers from redoing their work. The result was an estimated savings of more than $5,000 a year in labor costs (Jacobson 72).

Probably the most important reason for the popularity of QC programs is the success of high-quality Japanese products at competitive prices in the United States. The press and many scholars attributed this success to Japan's superior approach to management, which includes quality circles. People came to see quality circles as a way for the U.S. to regain a competitive edge. Favorable press reports of some early successes of quality circles in the United States reinforced this perceptive (Lawler 66).

The nature of the QC structure and process minimizes the threat to management and thus increases the likelihood of management support. Policies and guidelines for the QCs are determined by management. The first-line supervisor is a team member and is usually the team leader. This arrangement helps prevent the potentially negative consequences found in some autonomous work groups where management has been excluded. It also provides the means for problem solving which is within the authority of the first-line supervisor, as well as, a way

to communicate to top management those problems that are not (Blair 21).

Managerial prerogatives are further protected by explicitly specifying and limiting the types and scopes of problems that QCs can address. QCs are to deal with factors within the work unit which are impairing quality and productivity or changes that can be made in the work unit which will improve productivity. QCs are usually instructed to avoid sensitive issues such as grievances, pay, union-management relations and any other issues which are either beyond the scope of their work unit or not directly related to quality and productivity (21).

The integrity of the management structure is protected. Because management are members of the steering committees, they are informed about what the QCs are doing. This should decrease conflict between management and labor, as well as, reduce the threat that QCs will preempt their responsibilities. Integrating QCs into the existing managerial hierarchy should minimize the feelings among managers that they are being bypassed and should reduce the conflict that evolves from competing for authority (21).

Some features of QCs have also contributed to their popularity. The programs are accessible: an executive can buy a standardized package for a fixed price, complete with training and support materials with instructions on how to proceed. This turnkey approach appeals to many managers, because it is similar to the way they make other purchases, such as machines and training programs (Lawler 66).

Qualtec Inc., a subsidiary of FP&L, is selling the utility's quality-circle packages to other companies. Qualtec is expecting sales to such companies as AT&T, Boeing Military Aircraft and Eli Lilly. The revenues from these packages should produce at least $3 million annually over the next several years (Fins 95).

Secondly, quality circles do not have to involve everyone. Because of this, management can easily control the number of employees involved as well as the size and cost of the program. Managers can "test the waters" with a small number of quality circles and expand that number if they work (Lawler 66).

At Wisconsin Electric Power Company, the quality circle process, The Next Step Program, began with just over 40 people. The participants were teamed into groups of six and by practicing the problem-solving techniques were able to generate suggestions to improve service quality. In all, more than 160 ideas have been implemented. Other departments began expressing their interest in joining the program or starting one of their own. The program goal now is to have about 1,000 employees from different departments participate in the program so that participants will have a better understanding of the importance of meeting the customer's needs (Bemowski 50-1).

Thirdly, quality circles have no decision-making power. This means that managers don't have to give up any control or prerogatives. Also, by being parallel to and not an actual part of the

organization's structure, managers can easily eliminate QCs if they become troublesome (66).

Finally, as everyone knows, quality circles are a fad. Some companies have tried quality circle programs on a trial basis simply because they symbolize modern participative management. In some cases, the circles were a matter of what the top told the middle to do to the bottom (66-7).

Fads are often born out of a need to solve legitimate problems. However, since most long-term solutions require discipline and sacrifice, they are often dropped for the new, revised edition. In the words of Deming, "When it comes to improving what we do, there seems almost to be a flavor-of-the-month approach, with each new, highly touted technique stepping on the heels of the one that went before..." ,thus we are susceptible to one fad after another (Estey 32).

Inspite of the fad claims, management research has shown that the QC process provides an apparently safe and legitimate approach for a major organizational intervention since it focuses on productivity and quality improvements. Management can justify this approach much more easily than one that emphasizes quality of work life with the hope that there will be a productivity payoff. In addition, management maintains control over the key decisions and maintains illusions of being in control of the QC program. The QC members are given the incentive of gaining enhanced roles in the organization. And at the

minimum, the process provides the opportunity to cope with some of the day-to-day irritants in the work place (Blair 21).

The QC process can also be an excellent device for development and change within an organization. Training in problem identification and solving are valuable to both workers and managers. The QC experiences can help to increase the members' appreciation of the complexities of solving problems in the work place and could increase their awareness of the overall complexities of management and organizational processes. Likewise, management may develop a deeper appreciation toward the workers and their problems and capabilities. The organization's ability for coping with and solving problems is enhanced. Calling attention to problems is legitimized, as is requesting the information necessary for identifying and solving problems (21).

QCs have an effect on an individual's relations with others, as well as his attitudes toward the company. This is due to employee participation in decision making and greater interpersonal contact among organization members within the QCs. QCs help to increase the workers' understanding of the difficulties of problem solving and that many problems can not be solved quickly (Gryna 22).

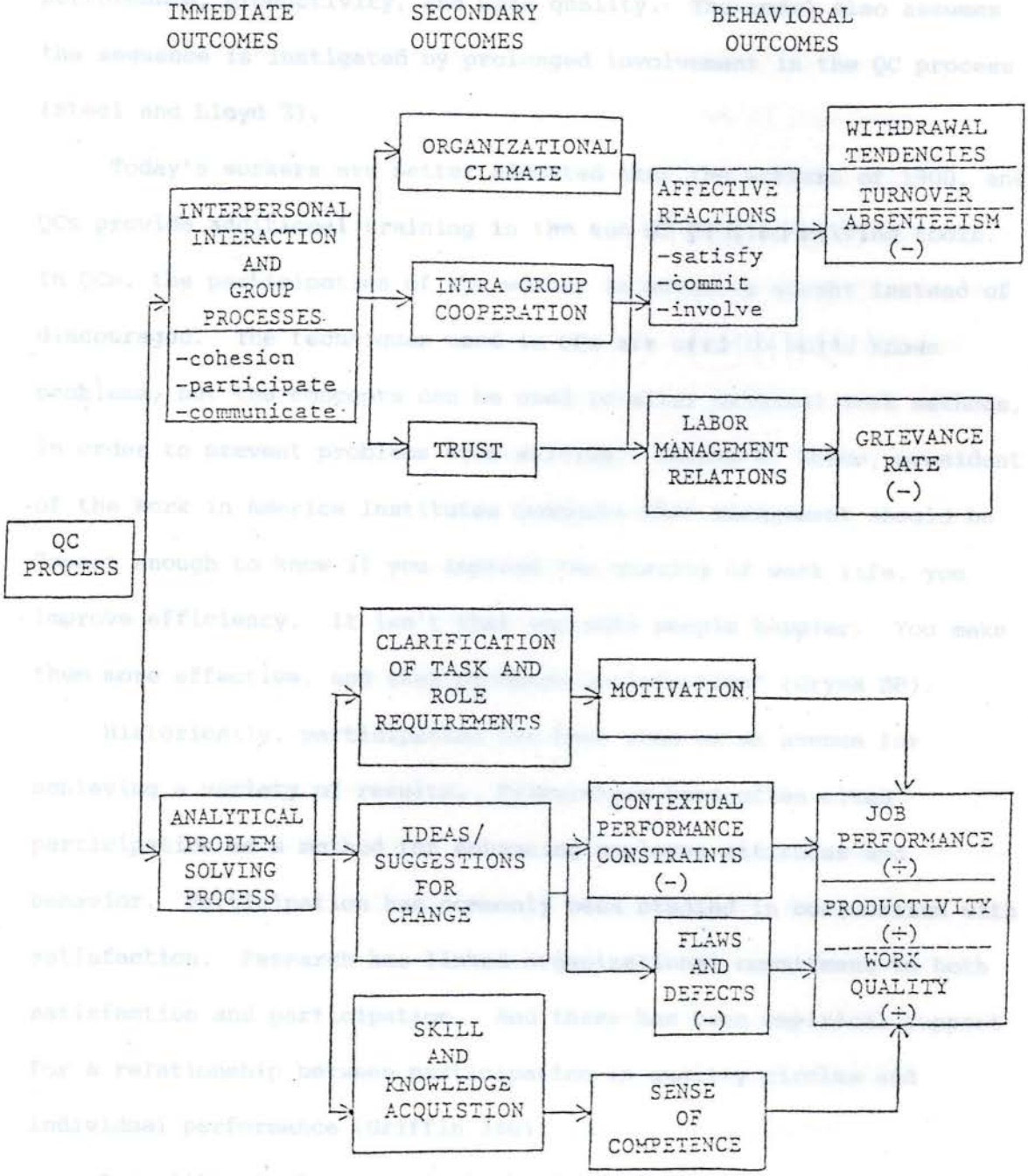
The participative effects suggest that participation in decision making is a viable strategy because it enhances the flow and use of important information within the organization. The workers typically have more complete knowledge of their work than management; hence, if workers participate in decision making, decisions will be made with

better pools of information. In addition, if employees participate in decision making, they will know more about implementing work procedures after decisions have been made (Miller and Monge 730).

For example, at Wisconsin Power & Light Co.(WP&L), Kathy Shepherd, Collection Office Clerk, was a member of a customer action team. The team conducted a test that was intended to determine if a special 17-hour water-heating rate actually saved the customers money. After over 180 random tests, Shepherd says her experience on the quality circle team had given her a different perspective about solving corporate problems. She felt that by participating in the problem-solving process, she began to understand how difficult finding solutions can be, especially when that solution must be coordinated with so many people. Mike Wish, Director of Corporate Services, sees these teams as being critical to WP&L's future success. He says that managers are not all-knowing; supervisors are not in the trenches every day dealing with customers. Wish explains that "employees who work directly with the customers know which practices, policies and programs truly make a difference" ("Quality Teams,..." 16-7).

Figure 1 is a schematic diagram of the heuristic model of major outcomes of the QC process. While this model does not attempt to show all possible outcomes or contributing factors to successful QC programs. It does reveal that participation in the QC process results in a sequence of personal and organizational outcomes starting as immediate program-specific outcomes. These will gradually change into secondary cognitive and affective consequences, and ultimately

Figure 1. Outcomes of quality circle outcomes



SOURCE: The Journal of Behavioral Science. Exhibit from "Cognitive, Affective, and Behavior Outcomes of Participation in Quality Circles: Conceptual and Empirical Findings," by Steel and Lloyd 24.1 (1988).

culminate in behavioral outcomes that will result in improved job performance, productivity, and work quality. The model also assumes the sequence is instigated by prolonged involvement in the QC process (Steel and Lloyd 3).

Today's workers are better educated than the workers of 1900, and QCs provide additional training in the use of problem-solving tools. In QCs, the participation of the worker is actively sought instead of discouraged. The techniques used in QCs are used to solve known problems, but the concepts can be used to alter original work methods, in order to prevent problems from arising. Jerome M. Rosow, president of the Work in America Institutes comments that management should be "smart enough to know if you improve the quality of work life, you improve efficiency. It isn't that you make people happier. You make them more effective, and that produces satisfaction" (Gryna 88).

Historically, participation has been seen as an avenue for achieving a variety of results. Researchers have often cited participation as a method for enhancing employee attitudes and behavior. Participation has commonly been studied in conjunction with satisfaction. Research has linked organizational commitment to both satisfaction and participation. And there has been empirical support for a relationship between participation in quality circles and individual performance (Griffin 340).

A quality circle process at the Public Service Co. of Oklahoma (PSO) is called QUEST (Quality-Excellence-Service-Teamwork). At PSO, every action and every service must contribute toward satisfying the

customers' expectations. According to Martin E. Fate, Jr., President, it takes people with concern and sound judgment to make the difference in providing responsive customer service, doing quality work, and achieving business goals. Even though PSO is one of the least-costly suppliers of electricity in the U.S., responsive customer service is a prime commitment of its employees. With only 4.5 employees per 1000 customers, PSO has consistently been ranked with the lowest or second lowest employee-per-customer ratio of the 22 major investor-owned utilities in the south-central United States. Operating with such a lean staff demands the highest productivity from employees, and PSO consistently has a low customer complaint rate (Enabnet 8).

QC participation requires regular group meetings, during which the members work together to solve common problems. The QC problem-solving process helps to clarify tasks and role requirements for each member. The reactiveness of QCs afford participants experience in developing and using these problem-solving skills. QCs permit individuals the unique opportunity to use the resources of the work group to gain a sense of control of their work lives. They help by reducing performance barriers of their individual work tasks. These barriers may be psychological, such as attitudes, or they may be physical, such as communications between departments. Research has shown that an enhanced sense of task competence can contribute to improved task performance (Steel and Lloyd 6-7).

One group of employees at WP&L has already achieved some impressive results. The team's task was to try to reduce the time needed to determine whether a customer's utility line was underground or overhead after the customer's requested information for digging clearance. The team discovered that 70 percent of the time, the customer's line turned out to be an overhead service. But the only way to find out what type of service a customer had was to make a trip to the residence; so there were a lot of wasted trips. The team's solution made use of the metering department. Meter readers would document whether a customer's service was overhead or underground while they read the meter. This documentation was made available to the service supervisor, who could determine right away if the service was underground or not. A locator would then be sent only to residences with underground services. The time saved by this solution has been estimated at 1,500 hours annually ("Quality Teams,..." 15).

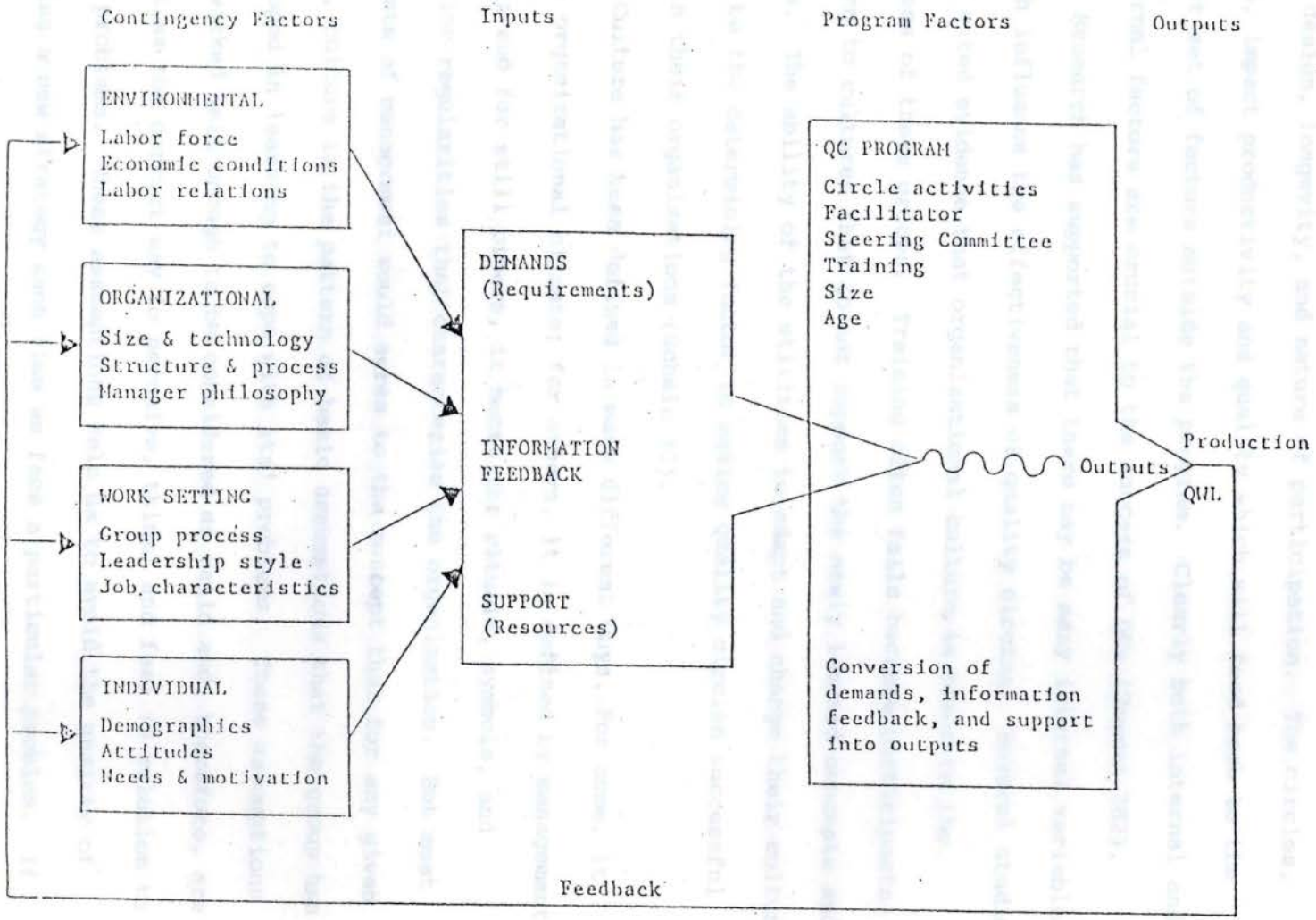
There has been much literature written of the effects of participation in decision making on employee satisfaction and productivity. Evidence has provided strong support linking a participative climate with worker satisfaction. This evidence should demonstrate that participative management programs will work to increase productivity in the utility industry. But, in spite of the overabundance of research studies investigating participation, when reviewers of the literature draw conclusions on its effectiveness, they will invariably state that "it depends". The question of just what it depends on has never been clearly answered. To consider if

quality circle programs will provide the utilities with a competitive edge, these factors will have to be further reviewed (Miller and Monge 728).

Quality circles can provide that competitive edge if they are successful, but success is not guaranteed. The process does not automatically fit in any straightforward way into most American management systems. QCs are not just another program oriented toward changing individual attitudes. They represent an intervention into the organization itself and, for most organizations, a potentially significant change in the management structure and assumptions made about employees and how they are to be managed. Like a graft that is subject to rejection by the host organization, QC survival is a major issue of concern. Figure 2 identifies and illustrates several classes of variables which will affect the ability of QCs to survive (Blair 18).

It has been suggested that there are two sets of factors to consider when assessing the likelihood of successful institutionalization of quality circles. The first set are those factors that deal with contingencies outside the program itself that provide the context in which it operates. Among these are environmental factors (e.g., economic conditions), organizational factors (e.g., management philosophy), work setting (e.g., job characteristics) and individual factors (e.g., personal attitudes). These conditions supply inputs in the form of demands and supports that effect the second set of factors dealing with the program itself:

Figure 2. Contingency Model of a Quality Control Program as an Organizational Subsystem



SOURCE: Business Horizons. Exhibit from "Can Quality Circles Survive in the United States?" by Blair and Whitehead 27.5 (1984).

its design, longevity, and nature of participation. The circles, then, impact productivity and quality which will feed back to the first set of factors outside the program. Clearly both internal and external factors are crucial to the success of QCs (Bowman 382).

Research has supported that there may be many internal variables which influence the effectiveness of quality circles. Several studies have cited evidence that organizational culture is basic to the success of these groups. Training often fails because participants return to cultures that do not support the newly learned concepts and ideas. The ability of the utilities to adapt and change their culture will be the determining factor in making quality circles successful within their organizations (Schein 30).

Culture has been defined in many different ways. For some, it means organizational climate; for others, it is defined by management style; and for still others, it means the rituals, symbols, and behavior regularities that characterize the organization. But most students of management would agree to the concept that for any given group, culture is the pattern of basic assumptions that the group has developed in learning to cope with its' problems. These assumptions have worked well enough to be considered as valid and, therefore, are taught as the correct way to perceive, think, and feel in relation to those problems. These assumptions help us to avoid the anxiety of figuring a new strategy each time we face a particular problem. If the assumptions continue to work, they are taken for granted as being the correct way to handle the situation. The more these methods are

used for perceiving, thinking, and feeling, the more they are taken for granted. Culture is this pattern of automatic assumptions, unconsciously held and taken for granted (31).

The most important culture belief is the valuing of collectivity versus the belief for individual enterprise. Most entrepreneurial organizations in the United States are known to value individual effort and achievement. In contrast, Japanese organizations are guided by an organizational culture that strongly values collectivism. In Japan, the culture operates so that nothing of consequence occurs as a result of individual effort. Anything of importance happens because of teamwork or collective effort (Miller 706).

Culture implies values that set a pattern for an organization's opinions and actions. This is implanted in the employees by the examples set by management and passed on to succeeding generations of employees. Profit is a value in all private-sector firms. In excellent companies, the organizational culture integrates profits with other values relating to communication, decision making, discipline, feedback, and delegation. Unfortunately, in these areas the requirements for employee participation are in direct conflict with the autocratic cultures so prevalent in the utility industry (Chelte 161).

The electric industry is looking toward the future from a perspective that is vastly different in almost every respect from any in its history. Instead of planning new plants and lines, management is looking at their corporate cultures. Southern Company Services

(SCS) president, Ed Addison, states that Southern's corporate culture would have to change in order for the company to remain successful by 1995. Standing on the threshold of the competitive 1990's, the electric companies are redirecting their focus to succeed in a new environment ("Projects of the 1990's ..." 57).

The utility industry culture has belonged to the traditional or control-oriented approach to work-force management. This style began to take shape during the turn of the century in response to the division of work into small, fixed jobs for which individuals could be held accountable. Productivity was based on accepted standards of performance and rested on "lowest common denominator" assumptions about an employee's skills and motivation. In an effort to monitor and control this productivity, management organized its own responsibilities into a hierarchy of specialized roles supported by a top-down allocation of authority (Walton 76).

In the traditional approach, there was very little policy definition pertaining to employee involvement. Management relied on an open-door policy, attitude surveys, and other similar devices to learn about employees' concerns. If the work force were unionized, management would bargain terms of employment. Inevitably, an adversarial relationship would develop between workers and managers. Management began to feel the exclusive obligation was to the company's shareowners and the ownership of property was the ultimate source of obligation and prerogative. The concerns of the employees were topics to be avoided (76).

At the heart of this traditional style is management's desire to establish order, exercise control, and achieve efficiency in the application of the work force. This traditional style was somewhat similar to the bureaucracies of both church and military. It was Frederick W. Taylor who first considered this style as a model of management. Being known as the "father of scientific management", Taylor's views about the proper organization of work has long influenced management practices in the United States (76-7).

Recently, however, the changing expectations among workers have caused them to become disenchanted with control management. A culture that assumes low employee commitment cannot match the standard of excellence set by world-class competitors. Market success depends on a superior level of performance, a level that requires the deep commitment of the employee. This commitment, as experience shows, cannot flourish in a workplace where the control-oriented culture is dominate (77).

Top management must understand the present culture of the organization in order to make appropriate decisions about what is effective "new" behavior. Management's behavior often stands in contrast to its words. Where employee participation is unsuccessful, top management has usually failed to recognize the constraints imposed by the long-standing and pervasive corporate culture. In the top-down management environment, employee involvement has become a threat to the integrity of this culture that has proved to be so profitable.

Consciously or not, top management seems to recognize this and has removed employee participation from their agenda (Chelte 162).

A key to this new thinking is the acknowledged fact that a procedure-based bureaucracy is bound to fail in the new competitive environment. Changes in an otherwise conservative industry reflects the acceptance on the part of management of the new realities. As proposed by SCS, these changes should include:

* Teamwork,
* Accountability at the lowest organizational levels,
* Open and honest communications,
* Leadership sensitive to employees' needs,
* Innovation and informed risk taking,
* Multiskilled employees,
* Knowledge of customers and competitors, plus,
* Ability to deal with change.

The remarkable aspect of the new corporate culture is its stress on human values rather than the technological ones. The new realities are not all that new, they have just been recognized as a crucial ingredient to any organization that is part of the market place. These new realities can be summed up as "a company's success is a function of its people" ("Projects of the 1990's ..." 57).

Circle effectiveness over time is likely to depend on the extent to which there is a consistency of QC values and those of the company. Many researchers claim that organizations having values, philosophies and behaviors that are compatible with providing responsible,

participative and shared decision-making are more the exception than the rule. Managers may advocate participative values, but they may not behave in a manner consistent with them. They had been promoted on the basis that they could solve problems. This could lead them to exhibit a lack of faith in the abilities of subordinates (Bowman 379).

The executives most opposed to the participative structure also tend to be those executives who 1) were the firmest believers that every now and again employees need a boot in the ass, or 2) lost power under the participative structure, or 3) both. Most managers worked their way up from the stock boy level under a management structure of close supervision. The participative structure disconfirms the merits of the management approach which they had skillfully learned and mastered over the years and on which a large measure of their positive self-concept rested (Luke 631).

Management, as a rule, can be reluctant to change. C. O. Woody, the executive vice president in charge of FP&L's nuclear division, for example, remained an unbeliever even after QC introduction to that organization. Then in the fall of 1984, a team from the St. Lucie Z nuclear plant cut its refueling shutdown time in half, saving the company $28 million. Woody talked with the workers and found that the method they used had grown out of their quality-management teamwork. They told him that they had never worked so hard or enjoyed themselves more (Jacobson 71).

Observers have noted that executives in the United States engage in "crisis management". The focus is on immediate problems with short term answers rather than on long term strategic implications for the organization. W. Edwards Deming feels that most quality circles in the U.S. are managements' hope for a "lazy way out, management in desperation". But what these executives don't realize is that QCs are a theory of management not simply a program. It takes careful planning in order to establish successful QCs. Decisions to implement QCs that emphasize short term goals not only diminishes their effectiveness, but may also cause worsening productivity problems. If the QC effort is not well managed, past practices and behaviors are likely to overpower it (Bowman 378-9).

It is important to recognize how management style and organizational culture can affect the operation of QCs. While data suggests that many employees are prepared to make the program work, management must be clear about its goals and potential. Management must develop effective ways to communicate with workers about the program. These should include devotion of time and resources to the project and to providing company-wide support. It seems evident that for the quality circle process to become a function of the organization, it must be led by managers, taught by managers and modeled by managers. Management must learn and practice this process among themselves before they can reasonably expect their subordinates to master it. It is simply not enough for managers to become familiar

with the process, attend circles presentations and then banish QCs to the lower ranks.

Instead, there should be careful attention devoted to the actual effectiveness of QC activities. Some groups have experienced outright management antipathy and employee resentment. The feelings of resentment have stemmed from the lack of response by management and the inability of the process to function as it was intended. Although these perceptions are not representative of all the QC participants, they do underscore the key role of management expectations. They are also valuable indicators of what can happen if there is a lack of effective follow through (Bowman 392-93).

At Union Electric Co. (U.E.) an action plan has been implemented which focuses on empowering management. Part of the plan is to train and utilize middle management as facilitators to achieve a quality improvement environment. The plan will also require these managers to be the teachers of their organizations on the application of the process tools and techniques. By encouraging managers to form multiple task teams to solve departmental problems and by developing performance indicators to monitor the process in all areas of the organization, U.E. hopes to assign accountability for quality circle implementation to middle management (Randolph 2).

Each organization has a unique culture that sets expectations. Participative work groups sometime find it hard to fit in with the different cultures and their varying expectations. Under traditional leadership, decisions are reached at the top and communication flows

downward. Input from the lower levels is sought only to respond to problems or to report data that top management needs for decision making. Both middle management and line staff are unaware of their potential to contribute to the organization's goals and decision making. Americans are not accustomed to having any significant input in decision making. Lower level employees simply do not believe that what they have to say really matters or that their one voice will effect the outcome (Vogt 98).

Recognizing that significant changes were occurring in the electric utility business, Southern Company Services (SCS) decided that it could not continue doing what it always had been doing and still remain competitive and successful. They realized that using the QC process will not only increase efficiency, it will connect each employee's day-to-day job to the goals of the company. It also provides the mechanism to offset increased labor costs by a corresponding increase in productivity.

The QC process at SCS has provided the resources to reduce costs, improve quality, and modify employee behavior. With respect to behavior modification, the changes are expected because employees are now in a position to participate in making decisions that affect work practices, and ultimately, the company's financial standing. This position of influence on company policy has had a significant and positive effect on the employee's perception of his value to the company (Davidson 42).

Since QC programs represent "bottom-up" management, their long-term success within an organization will require the commitment on the part of management to the fundamental change away from the "top-down" management style. Management must be responsive to workers and realize their capabilities and value their participation. A lack of commitment to any of the areas may lead to the termination of the program when pressure for greater changes develop (Blair 22).

In a study conducted by the Conference Board of New York, New York, the members of its Quality Council felt that successful approaches to quality programs depend on the dedication of executives beyond public pronouncements. Top management is responsible to instill a quality culture that permeates every level of the organization. The council members felt there is a lack of top-level commitment to these programs and there is an overemphasis on the short term ("The Fear That Clears ..." 24).

Today, top utility executives are beginning to recognize that some of the most basic assumptions on which the organization was built and that led to its success now may be disfunctional because of environmental changes. If present management cannot leave these disfunctional cultural assumptions behind, broad cultural destruction may precede any building of a new organization with a new culture. Management must be willing to not only bring these sacred cows out into the open, but they must also be willing to challenge and, in some cases, destroy them (Schein 33).

The question that must be asked here is: are utilities ready for QCs? As society changes, the industry must adapt to those changes. How well the utilities are able to adjust will determine whether or not their customers will continue to choose their products.

The first place to look for change by management is at themselves. The management of an organization falls somewhere on a broad spectrum between the two extremes of participation and autocracy. Utilities have been managed autocratically since their development. Companies tending to be autocratic will have a more difficult time with the change. Dr. Robert Conroy of the Menninger Center of Applied Behavioral Science in Topeka, Kansas, says participative management is hard to implement, because it means giving up something in order to get something. Managers must give up a certain amount of control. They must learn to share decision making with their employees. If a cordial labor-management relationship fails to develop and management remains unresponsive to QCs, then it is unlikely that the QC processes will have any positive benefits (Schmidt 7).

Change cannot take place merely by sending people to school. To modify an organization's culture, top management has to change its own behavior. The "transforming" leader transforms by action and builds new meanings with new behaviors. Even appeals by the chief executive will not succeed unless they are backed by changed cultural structure and new role models. Too often CEOs are role models, but for the old ideas, values and beliefs of the organization's culture. Without an

understanding of the power of corporate culture to shape behavior, the leadership necessary to implement the change is likely to be frustrated (Chelte 162-3).

Management in the United States cannot expect to simply introduce QCs into an organization and expect them to succeed. QCs need to be integrated into the organization instead of added to it. Joseph M. Juran, one of the reputed fathers of Japanese management, feels that quality circles are different enough from other programs, they should be regarded as a new organizational form. They evolve over a period of years and are nurtured by cooperative labor-management relations and strong management support. It follows that American managers will have to adapt their management practices and organizational philosophies to accommodate quality circles (Bowman 377-8).

Historically, Japanese managers have been more receptive and committed to employee participation in the workplace than American managers. But the fact is that circles do not work very well in many Japanese companies. Even in companies that are recognized as having the best operating programs, only one-third of the circles are working well, with another third borderline and one-third making no contribution at all. In a number of companies, the workers clearly perceive circle activities as coercive. Management support for QCs often comes, not from concerns with employee involvement, but from concerns with problems of quality, productivity, absenteeism, turnover, or grievances (Blair 17).

One of the major problems is the lack of strategic planning for the organizational change and for the role that participative work groups play in the change process. There seems to be a lack of realistic evaluation of the effect that these groups have on the organization's structure. Management seems to be unaware that there will be systematic changes occurring when participative strategies are adopted. Participation, in effect, increases the demands for restructuring organization policy making. The impact of QCs on organizational structures must be considered for both their long- and short-term effects (Vogt 96-97).

Resistance by management is real and much of it is understandable and even justifiable. Managers, as a rule, are not so obstinate that they try to undermine change. It is just that organizations have always placed them in the middle of no man's land, and most employee involvement programs make their position even more precarious. Designed to boost productivity through worker participation, the programs rarely take into account the interests and concerns of middle management. Predictably, seeing nothing in the program for themselves, these managers may begin to resent the loss of power and control. In one way or another, they fall into a pattern of resistance. By taking seriously the interests of middle management, the top executives can break this pattern. And often, after giving the QC programs a chance, managers find real value in them (Klein 93-5).

Marshall McDonald, ex-CEO of FP&L, recalls the revolt of the middle managers during the early stages of that company's QC process. FP&L had committed a lot of time and money on training when it suddenly became apparent that there was significant resistance from middle management. The reason was that top management and workers were getting fired up, but that middle management was being ignored entirely. These managers did not know what to do with the good ideas coming from the circles, they worried about losing some of their authority and they resisted change-when change was the idea. Soon, middle management joined the training regimen and the process continued to expand (Jacobson 74).

Usually the people who must accept and act on the ideas of the circles are middle-level managers. Most of these managers have little or no role in the activities of the circle and some have little experience in soliciting or responding to ideas of subordinates. Management is sometimes uncomfortable listening to ideas they feel that they should have thought of themselves or that may result in a change in their own activities. It is not surprising, that these middle managers often resist new ideas, either formally rejecting them or taking a long time to respond.

There was a perception at U.E. that a separate chain of command had been created in the organization and that middle management had been purposefully left out. The support that the teams did receive from middle management was primarily motivated by fear of being seen

as a roadblock for this separate chain of command. In summary, middle management had been left out of the process (Randolph 2).

The ultimate source of the most serious problems in the organization is managerial decisions, processes and behavior. QCs can compensate for only a limited amount of these management inadequacies. However, these inadequacies can have a much greater affect on the ability of QCs to survive. The importance of management commitment is not unique to QCs; it underlies the success or failure of any productivity improvement efforts (Blair 22).

In these new commitment-based strategies, the essence of management is shifting from giving orders to involving employees. As a result, jobs are designed to be broader, to combine planning and implementation, and to include efforts to upgrade operations, not just maintain them. This new corporate strategy puts the responsibility on the employee to initiate changes and solve problems. Individual responsibilities are expected to change as conditions change, and teams, not individual workers, will be the organizational units accountable for productivity. Under the commitment strategy, performance expectations are high and serve not to define minimum standards but to emphasize continuous improvement (Walton 79).

Erroll Davis, president and CEO of WP&L, knows that the employees are the key. Both management and contract employees must understand that survival will depend upon their ability to work together to serve the customers best in the marketplace. Davis feels it is important

for all managers to understand that all employees are able to make valuable contributions to their companies ("Repositioning ..." 11).

It has been difficult for some managers to accept this radically new culture. Too often, managers believe they are seeking cooperation when they are actually asking the workers to just follow orders. When they seek involvement, they are really expecting more enthusiasm in following orders. And flexibility means the worker should have no objections to any orders given by management. Companies have failed to make their managers realize how vastly different this culture will be (Fischer 12).

At U.E., the Nuclear Division used the 7-step problem solving process to check the implementation of the Quality Improvement Process (QIP). They found that middle management employees had little real understanding of or true support for the process. Middle managers did not know the status of teams operating in their areas. They did not attend meetings regularly. They rarely asked team members questions about their work with the process. In fact, most middle managers felt that their involvement with a team would be seen as interference by both team members and upper management (Randolph 1).

Because of the time and effort invested in the QCs, mangers feel a great deal of pressure to accept any initial suggestions. They know that the program could lose its momentum if these ideas are not accepted. In fact, there are some instances where upper management has insisted that middle managers accept all initial suggestions.

Such situations have created bad feelings about the programs, and subsequent ideas are received less favorably.

In many cases, the people in charge of implementing the circle's suggestions are not involved in the functioning of the circle, and therefore, have little invested in them. But unless these ideas are converted into actions, QC programs will begin to lose their momentum and die. Management approval may be pleasing to the participants, but it is not enough to motivate them to come up with new ideas. People need to see their ideas in action and they need to receive feedback on how well these ideas are working. Because it is so hard to effect some of these changes within an organization, a significant percentage of QC programs end at this point (Lawler 68).

Feedback for the process is more complicated than the old adage "nothing succeeds like success." A major problem for QC programs is that successful ones can breed the conditions of their own termination. Once top management feels that the program has become successful, it may no longer see the need to give the QC the attention it was given initially. This is not to deny that successful QCs will generate increased interest, greater management support and new resources. The fact is that feedback is a contingency factor that could effect the QC system and its long-term survivability (Blair 23).

In the autocratic style of management, feedback emphasizes the negative. Communication is often used to punish mistakes rather to reinforce positive behavior. Supervisors and managers in this culture have resolved themselves to focus on their own tasks. To take a team

approach to their work would only increase their exposure to punishment for someone else's mistakes. As the demand has begun to press on capacity, not getting caught making a mistake has come to have more to do with meeting production numbers than the concerns with quality (Chelte 161).

Dealing with problems openly and having more open communications can lead to a supportive climate. A supportive organizational climate can enhance both the performance and development of QC members, as well as, reduce conflict between workers and management. With management support, the overall performance and innovative capacity of the quality circle group should be improved (Blair 21).

For example, at PSO's Southwestern Station, manager Emil Palesano has succeeded in creating an atmosphere in which employees do not feel threatened to ask questions. At the end of safety meetings, he opens the floor to comments or questions on any subject from employees. As a result, employees now feel they are better informed and morale at the station has risen significantly. Before there was distrust and closed communication. Participative management has opened the door for everyone to have a say in how the work is done (Schmidt 6).

The support of first-line supervisors is essential if meaningful changes in organizational culture is to take root. Supervisors rarely show open resistance to programs initiated by upper management. They perceive that their job security is dependent upon following up on management's suggestions. Supervisors may occasionally criticize a program in discussions with peers and subordinates. But more often

they remain silent or demonstrate only mild enthusiasm, which the workers interpret as a questionable show of support (Klein 88).

Training is an indispensable first step in defining the common language and strategies for change, but the usual classroom of seminar-based training is not enough. The best training includes continual consultation with the manager, who should provide feedback and coaching. The quickest way to modify a supervisor's behavior is for managers to become role models. Seeing the change in action has helped to convert several hard-liners. The supervisors need to be shown that their superiors are committed to a participative style of management (92).

Perhaps the most significant change associated with the participative structure is not the change in behavior and performance of the manager, but the change in attitude about supervision. Some executives now believe that 75-80 percent of current supervisors can contribute more to their company if they are supported and trained rather than closely managed. It is important to realize that this change in attitude will occur as a function of upper management's direct experience with a situation familiar to them. It is unlikely that this change occurs as a result of specific attitude training (Luke 630).

Increasing efficiency and effectiveness in industry has become a national priority. Real productivity improvement can only occur from changing what people do and how they do it. Qualtiy circles are a seemingly conservative technique that will enable management to

achieve change. Yet some organizations are still treating QCs as just another personnel program rather than a process to be institutionalized as a new way of doing business. True productivity improvements requires facing knotty problems of policy revisions and investments in the long term.

Progress will run into resistance from those who have a vested interest in doing business as usual. It must be recognized that the QC process is a slow, incremental technique designed to prevent problems and achieve lasting gains, not manage crises. QC programs require support throughout the chain of command; managers need to know how their objectives can be achieved through these programs. There must be a genuine commitment to participative management. Research has demonstrated that quality circles can work because they deal with work-related issues in a manner that blends company and individual goals (Bowman 395-7).

Research suggests that QCs can make a major contribution toward increased productivity. But skeptics about the quality circle process can still be found. They point out that what is being accomplished is by no means clear, especially with a minimum of training, varying degree of commitment and continuing uncertainty about the ways to measure quality in a service company. Management has to realize that quality is not free, it takes a lot of hard work and dedication. What is necessary first is to admit that the long-standing roles of managers and workers may need to be changed.

Quite a lot of data suggests that the quality circle process can be an extremely valuable tool in nearly any organization. Management and workers are continually amazed at the value of the intrinsic rewards that accrue from participation in the process, as well as, the cost returns from QC activities. Implementation of the process requires patience and recognition that it is a change in the corporate philosophy. It is not just a program or package that brings about dramatic effects, but rather it is a long-term commitment aimed at making significant changes over a period of time. With the proper preparation, communication, and commitment and ownership of upper management, an effective QC process ca be successfully installed as an organizational intervention (Yager 105).

Carefully managed interventions like quality circles have the potential to aid utilities as they attempt to compete in an unregualated market. Because it requires making many changes in the culture of an organization, this shift will be difficult. But the evidence will demonstrate that because of the utilities' commitment to quality and its willingness to change, the QC process will be successful in improving productivity. Specifically, it is hypothesized utilities will become more productive in terms of increasing customer satisfaction, while reducing operating costs. Or to state it another way, doing the job right the first time.

Chapter III

SELECTIVE REVIEW AND EVALUATION OF RESEARCH

Research has shown that each of us, because of life experiences, has developed a set of ingrained rules by which we view everything around us. These rules obstruct us from contemplating radical changes which could have a significant impact on the customer or organization. The challenge in today's utilities is to more fully involve all members of the organization in pursuit of continuous improvement. Quality improvement uses a participative management style to constantly strive toward improvement of every aspect of an operation. It will be up to management to integrate quality improvement into the way business is done at the utility.

It is clear that a changed utility climate will place the utilities in the same arena as other corporations. Electric utilities that continue to play in the small circle of conventional operations will give way to those who are playing in the large circle of innovative management. The bottom line for the new corporate culture is greater efficiency, lower operating costs, and greater profitability ("Projects of the 1990s ..." 57).

Recognizing that significant changes were occurring in the electric utility business, Southern Company Services (SCS) decided that it could not continue doing what it always had been doing and still remain competitive and successful. They realized that using the QC process will not only increase efficiency, it will connect each

employee's day-to-day job to the goals of the company. It also provides the mechanism to offset increased labor costs by a corresponding increase in productivity.

The QC process at SCS has provided the resources to reduce costs, improve quality, and modify employee behavior. With respect to behavior modification, the changes are expected because employees are now in a position to participate in making decisions that affect work practices, and ultimately, the company's financial standing. This position of influence on company policy has had a significant and positive effect on the employee's perception of his value to the company (Davidson 42).

Initiating a QC program costs a great deal. Ultimately many managers will begin to question whether the savings justify the expense. When executives try to document the actual savings from the QC ideas, the savings often turn out to be smaller than originally estimated. The disappointment over the actual savings and the significant expense of running the QC program often combine to provide a serious threat to the continuation of the circle (Lawler 69).

Nuturing the intangible benefits like teamwork, leadership, trust and loyalty is an essential component to an effective program. Recent attempts to improve productivity have tended to emphasize badly needed participative and motivational techniques, sometimes at the expense of more task-oriented productivity skills. The emphasis on quality in a quality circle program, however, requires a blend of both participatory and productivity concerns.

Quality circle programs must ultimately be assessed on the basis of a thorough evaluation of its costs and benefits. The strengths of the process must be assessed on the growth of active circle, size and scope of problems solved and the expansion of circles within the organization. Thought must be devoted to program measurement and incorporation of the process into the management style of the company. There is a need to clearly define what is to be achieved and to have a way to tell whether or not there is any improvement. If a project is started without a real goal and without a way of measuring it, total quality can never be accomplished. Typically, workers produce outputs and standards that can be identified and evaluated. Actual measurement of a circle's impact is difficult, but an indication of a relationship between circle activities and organizational success is a minimal requirement for attracting resources and management attention. An unmeasured program may be taken for granted and simply wither. There must be some capability to measure what has been accomplished. There is, however, no on-going effort to track and analyze the intangible or tangible benefits of QCs. Whether QCs survive in the long term - or even for the short term - is largely a question of time, and the ability and commitment of management to develop ways of measuring results maintaining momentum, and preventing failure (Bowman 394-5).

While all of the nation's 150 investor-owned power companies are at least giving lip service to improving performance, none has embraced the use of quality circles with the intensity of FP&L.

Florida's exploding population has increased FP&L's customer base by 20% since 1983, necessitating $300 million in new construction in 1988 alone. State regulators, buffeted by consumer complaints, have pressured FP&L to operate more efficiently and keep rates low (Fins 95).

Commitment to QCs began at FP&L in 1979. Quality teams at FP&L use a step-by-step process to identify an improvement opportunity, analyze the cause and develop a permanent solution. The goal is to make products that meet the customers' expectations. The operative word is "customer." The customers are the people on both sides of the transaction - inside and outside the company (Jacobson 74).

FP&L's extensive corporate-wide QC program began after a tour of Kansai Electric Power Company in Japan. Top management at FP&L was still a little uncertain whether a full-out quality program would work at a service company. But in 1984, Kansai Electric won the prestigious W. Edwards Deming Prize for outstanding achievement in the process of quality-improvement management, and all doubts vanished. This convinced company executives that building quality into everything and not cutting corners was the only way to grapple with the uncertain business environment.

Chairman John J. Hudiburg was so impressed with the progress of FP&L's quality circle program, that in 1988, he announced that the company would enter the competition for the Deming Prize. Senior management believed in order to control quality, the process had to start with quality circles using statistical-analysis tools to come up

with countermeasures that attack the root cause of a problem. They felt that team activity was the motivation for excellence in daily work. After working with the team approach for just a few years, the executives have realized that QCs can be the energy pushing for major improvements and to find solutions to apparently unsolvable problems ("After 'Quantum Leap'..." 22).

This pursuit of quality enabled FP&L to achieve their goal. In 1990, the Union of Japanese Scientists & Engineers (JUSE) awarded them the Deming Prize. FP&L became only the second electric utility and the first company outside of Japan to receive the award ("The Fear That Clears..." 23).

When FP&L started the QC program, customer satisfaction was viewed as a good indication of the success of the program. FP&L began improving customer satisfaction by identifying and eliminating areas of dissatisfaction. One way this was done was to look at the complaints leveled at Florida's Public Service Commission.

In 1985, there were 2,222 complaints to the Commission. This made FP&L the poorest-performing major utility in Florida. In 1986, FP&L conducted a survey of customers to identify problems and customer needs. The quality improvement teams then focused their efforts to improving these areas. By the end of 1987, the successfulness of the program was becoming apparent. The number of complaints received by the Public Service Commission was down from 1985's 2,222 to 1,143. By the end of 1988, that number was reduced to 879. In 1989, there were only 709 complaints (Bemowski 46).

The 1,700-member quality improvement teams have also made advances in other areas. FP&L has cut service interruptions to customers from 100 minutes per year in 1982 to 48 minutes per year in 1989. Nuclear Regulatory Commission violations also dropped to 40 in 1989 from 58 in 1986. And lost-time injuries have been reduced from 1 per 100 employees in 1986 to 0.42 in 1990 ("The Fears that Clears..." 24).

But the most highly visible benefits are showing up on the bottom line. Through the use of the quality circle-improvement techniques, FP&L has been able to shave fossil-fuel plant forced-outage rates from 14% in 1986 to less than 4% in 1990, saving the consumers $300 million that would have otherwise had to be spent on additional generation units. The teams found that by investing $100 million to update and repower a couple of generating units, FP&L has added capacity equivalent to a new 700-megawatt generating plant. This has allowed FP&L to defer the $1 billion construction cost beyond 1993. FP&L is adding 130,000 customers a year, an increase that would have most utilities seeking regular rate increases. The quality circle program has been so successful, the company has not requested a general rate increase since mid-1984 (Jacobson 75).

Other utilities are also showing signs of successful QC programs. As competition intensifies, WP&L is taking another look at how it is delivering its products and services. Top management has been willing to ask questions and challenge whether or not the present operation is the best way to be organized to serve its customers. WP&L is

committed to providing low-cost energy services to its customers through efficiency as opposed to new supply.

The QC process at WP&L is trying to change the way work is being done and how people involve themselves in their work. The program is driven by a problem-solving methodology directed at systems, not people. Any employee seeing the need for improvement in a particular system is encouraged to offer any constructive ideas on how to improve that system.

At the Rock River Generating Station, one circle's recommendation resulted in the company saving $160,000 annually. Through the use of statistical analysis, the team was able to study the effect on boiler efficiency of changing the gas stack temperature. They found that by operating the air bypass dampers in the closed position, there was less coal needed for operation.

Another cost-saving example took place at the Edgewater Generating Station. This team recommended shortening the sequenced shut-down time for the plant's pulverizers, the machines that grind up coal for use in the boilers. The group contacted other power plants with the same system and discovered that those plants were shutting their pulverizers down in half the time that Edgewater did. The members started experimenting, shutting down the pulverizers one earlier each time. It was found that there was no increase in coal buildup by shortening the shutdown time from 12 to 8 minutes and there was less wear and tear on the system. The team was able to convince WP&L executives that chopping four minutes off the shut-down time made

good business sense. The resulting decrease in fuel oil and electricity saves this company $44 each day or $15,032 per year ("Quality Teams ..." 16).

Besides saving dollars for WP&L, the QC teams have also improved customer service. For example, one team conducted a test project involving 17-hour water-heating customers. The test was intended to determine whether or not the special 17-hour rate - designed to reduce load during peak hours and save customers money - actually saved dollars for customers. After random testing 180 customers whose water heaters were allowed to charge 24 hours a day, they discovered that for the majority of customers, the water-heater cycle really did not run much more than it had when the heater had access to electricity only 17 hours per day. The team concluded that only if a customer used 300 kilowatt-hours or more each month, did the customer have significant savings. By the time customers paid the fixed charges for the special meter installation, they had actually spent more money than if they had just operated through the general service meter (17).

Salt River Project (SRP), a major utility headquartered in Phoenix, Az., is another company involved in the QC process. Management at SRP realized that in order to stay competitive, they had to improve productivity. The QC program is one of the key methods they used successfully to improve employee productivity.

At SRP, the QCs follow a structured, eight-step problem solving process. The process allows for detailed investigation and for identifying and eliminating barriers that might inhibit productivity.

The employees are trained to follow these steps of the problem-solving process:

Step 1: Identify a problem. The process starts with focusing the members' attention on their customers. Circle members identify their customers, each customer's requirements and any problems they have meeting those requirements. From these issues, the QC members select a problem to solve.

Step 2: Define the problem. It is important that each member have the same understanding of the problem. This may help to avoid later conflicts and disagreements. The purpose is to give the team members a common focus and understanding of the problem. This step is complete when QC members have agreed upon and written a single statement that describes the problem.

Step 3: Verify the problem. Sometimes the issues selected by QC members are not really problems. Data must be collected in order to verify the problem and to identify the magnitude of the problem. This step is complete when the team has collected data showing the actual impact of the problem on their particular area.

Step 4: Analyze the causes. To prevent problems from recurring, their causes must be identified and eliminated. In this step, QC members identify all possible causes and then collect data to verify the root cause. Once the true cause has been identified and verified, the members can move on to the next step.

Step 5: Determine the solution. In this step, the QC members work to identify the "best" solution to the problem. This solution should be the one that prevents the true cause and one on which all members can agree. By eliminating the cause of the problem, the solution will prevent the chance that the problem will happen again due to that cause. It is important that all members agree to the solution. If all members do not "buy into" the solution, implementation of the solution may be hampered. Solution selection will depend on the cause determined to be the true cause.

Step 6: Obtain management approval. QC members must obtain management approval before implementing their solution. The group must present to management the analysis they have completed and explain the group's recommendations and implementation plans. This step is complete when management responds to the recommended solution.

Step 7: Implementation. After management approval, the team can take steps to put their implementation plan into effect. This step is complete after the solution has been fully implemented.

Step 8: Confirm the results. It is important for QC members to review the results of their solution and determine if the problem has been eliminated. This step is the ultimate measure of success. The process is important to QC members and management, because it demonstrates the true impact of the group's effort. This step is completed when the results of the solution have been measured.

The results at SRP have been a savings of $1.6 million during the 1988 fiscal year. Thirty-three projects have been presented to management. These projects have varied from stocking levels in auto parts supply to a new filing system. Analyzing the processes within departments has successfully eliminated unnecessary computer reports and has streamlined backbilling procedures. QCs have focused employees on understanding and finding ways to better meet the customer's requirements. SRP has experienced cost savings and also indirectly benefitted through the development of employees as they become better problem solvers (Copp 46-7).

The goal of the quality circle process is to integrate quality improvement into the way of doing business at Union Electric. As the process is becoming a maturing effort, management has assessed the successes and failures, discussed strategy for continued implementation, and made recommendations about the best way to proceed with the program.

Since the process' introduction in Spring, 1986, the teams have made steady progress toward meeting the unofficial objective to involve half of U.E.'s employees. Employee participation peaked in August, 1990, as 2,500 employees - 36% of the company's work force - worked on 396 active teams. These teams implemented 157 solutions that has led to a projected savings of $10 million over the next five years.

An examination of the teams' progress has identified significant accomplishments associated with the process. The most significant benefits include:

1. The company placed greater emphasis on employee involvement in business operations and decision-making.

2. U.E. established a common problem-solving approach and language.

3. Through training, employees gained skills to help them continue to build a culture that emphasizes continuous improvement.

4. QCs helped build new levels of teamwork and cooperation through the company, demonstrated by better communications and additional flexibility.

5. The process enabled employees to demonstrate more of their individual potential.

6. QCs helped develop a customer orientation, an attitude essential for future success.

7. The team solutions that were implemented improved operations.

However, some negative consequences also emerged from the QC process:

1. Some teams lacked focus of direction and never identified a meaningful improvement opportunity.

2. In some team situations, management did not provide the support or direction, reacting to an early "hands off" emphasis.

3. The team process proved, sometimes, to be too time consuming. And occasionally the one-hour time allocation was too inflexible.

4. Middle management employees struggled to define their roles and responsible in the process, and often felt excluded.

5. Sometimes the practice of teamwork and employee participation never got beyond the team meeting ("Position Paper" 1-2).

At U.E., it is felt that the quality principles can be better integrated into the natural business process by emphasizing problem-solving and process improvements among natural management teams and natural work groups. The emphasis on quality is to increase customer satisfaction and exceeding customer expectations.

As U.E. started down the path of quality, one clear objective was the need to improve reliability. Customers seem to understand when they are out of power during a storm or a tree falls over, but they do not understand why they are out six to eight times in a year. By using the "Average Annual Customer Minutes Out (AACMO)" index, U.E. has been able to make comparisons with other utilities. A few years ago, the company was ranked in the lower third. Today, it is headed for the top third of electric utilities in its area.

The QC teams have taken the efforts made the previous year and quantifying the improvements they feel they have made. By applying the improvements to where U.E. is today, management is better able to project reliability goals for the coming years. By using the QC process, U.E. is taking the step of planning for improvements from the bottom up instead of the top down. It is hoped that all of U.E.'s objectives and goals will be accomplished this way in the future - not just in the area of reliability ("Profiles in Quality ..." 6).

Work processes and the results they produce must be understood in order to be effectively managed. Customers and their expectations must be thoroughly understood so that the correct products can be delivered. Effective collection, analysis and display of data allows team members to understand and communicate these important aspects of business. At U.E. this is referred to as "speaking with facts." Without sufficient information, the decisions may be based on opinions or unsupported conclusions. The consequences of such decisions could result in wasted resources, ineffective action plans for implementation or dissatisfied customers.

For example, Form 1101 was maintained by meter record clerks at U.E. for over 50 years. The form was used to keep track of the locations of current transformers (CTs) and potential transformer (PTs) throughout the company's system. The clerks would complete the form and file it. It was assumed that the file was necessary and utilized.

During their analysis of the CT and PT filing system, a QC team interviewed all users of Form 1101 along with representatives from legal and internal audit. The results were no one used the form, it was not required by anyone including the Public Service Commission and no one had even looked at the file for over five years. The form was able to be eliminated with a cost savings of over $19,000. Once the team spoke with facts, the assumption that the file was necessary was proven untrue ("Quality Improvement Process Manual" 21).

By analyzing the statistics involving cost savings, outage time and man-hour rates, the positive or negative effects of portions of the process can be measured. But measuring the overall successfulness of a QC program is difficult if not impossible. Utilities must also be concerned with looking down the road toward long-term cost savings. Work practices that are promoted through the QC process include how to lead, motivate, communicate, make decisions, interact with one another, set goals, control processes, and encourage learning. By solving problems through the better utilization of the knowledge and experience of all employees, the gains achieved through employee effectiveness will ultimately be beneficial to the customers, the shareholders and other employees.

Chapter IV

RESULTS

As deregulation increases and competition intensifies, electric utilities must recognize that they are moving into an open marketplace and away from a monopoly environment. It is competition that has spurred many companies to create quality programs. This indicates that top executives in the U.S. now agree that a total quality program is essential to assure competitiveness and that quality management is the key to long-term survival and profitability. Quality circles have been established by several utility companies to help them compete successfully in today's business world and to prepare them for an eventful future.

Entering the arena of competitiveness has utility managers concerned about the cost of doing business. Top U.S. executives at 106 electric, gas and combination utilities were surveyed to have them identify cost-containment programs introduced to their companies and to rate these programs' effectiveness. The outcome of the survey conducted by Stone & Webster (S&W) Management Consultants, Inc. is shown in Figure 3 on the proceeding page. The results show that almost every utlity has some program dealing with quality and that these programs are rated as being the most effective. Raymond G. Saleeby, senior vice president at S&W, says the goal trying to be achieved is to have all employees understand the realities of the

Figure 3

Cost-containment programs that are being tried by electric and combination, and gas utilities

Programs aimed at cost containment	Being tried,%	Percent effective	Percent very effective
Quality improvements	98	58	21
Information system enhancements	92	58	11
Inventory reductions	85	47	11
Organization flattening	81	59	16
Capital projects postponement	80	55	16
Hiring freezes	70	43	41
Staff reductions	70	38	44
Sale or lease decisions	75	49	16
Performance audits	60	65	16
Budget freezes	61	55	13
Wage and salary freezes	22	21	21
Better use of contractors	23	67	67
Life extension	23	73	27
Others	29	44	44

SOURCE: Electrical World. Exhibit from "You Can't Do More Work With Less Horsepower," (July 1989).

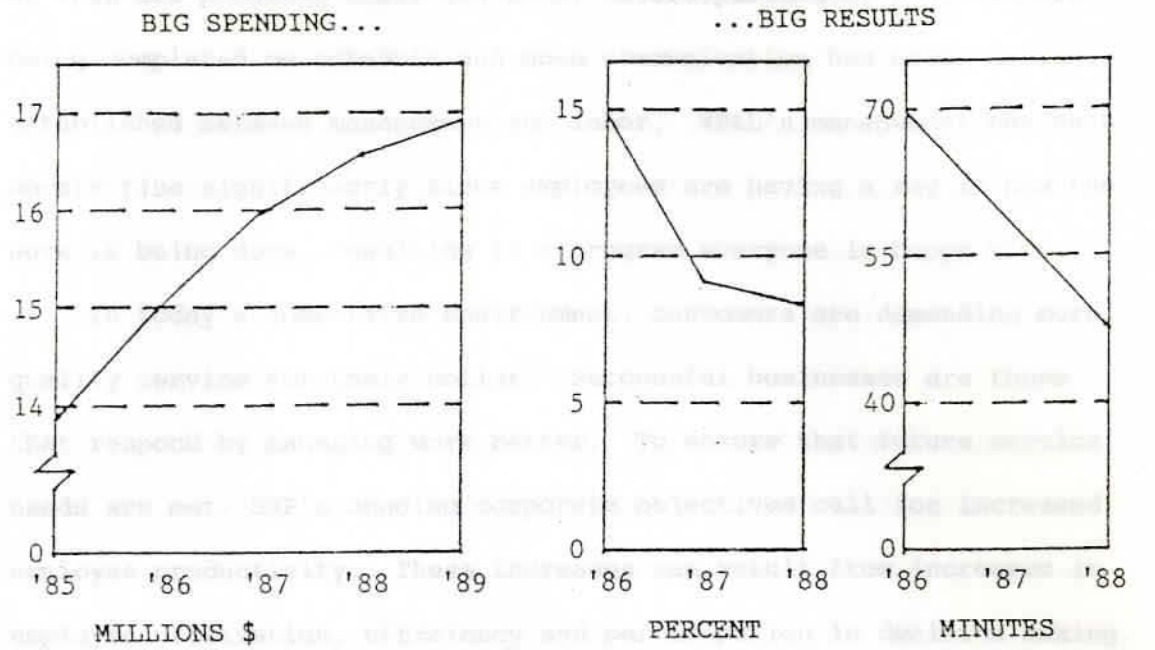
competitive environment and to win their support, cooperation and commitment to the programs ("You Can't Do More Work ..." 32).

The senior executives at FP&L wanted that utility to be known as the best managed investor-owned utility in the United States. They knew that in order to accomplish this, they had to integrate quality with management. The principal goal of the quality circle program at FP&L is the improvement of the organization.

Florida Power's management is not just giving "lip service" to this goal. The company is making sacrifices and committing its time and money to see that the goal is reached. Specialists have been brought in and set up full training programs for workers wanting to become involved. Courses cover such areas as statisical analysis, advanced problem-solving and decision making techniques, communication skills and group dynamics. With these skills, workers are able to analyze problems as they arise in their work and seek measurable solutions. All this takes money, and as can be seen in Figure 4, an indirect correlation can be established between the amount spent on quality circles and the improvement in plant downtime and customer outage time.

Quality circles have helped WP&L remain strong in the face of deregulation by providing customers with the most cost-effective and responsive service. Through programs developed by QC teams, the company has demonstrated its desire to be known as a superior value and its ability to provide customers greater satisfaction for their money than any of their competitors can offer. The QC process

Figure 4



SOURCE: Business Week. Exhibit from "A Utility That's All Charged Up Over Quality," by Antonio N. Fins (Feb 13, 1989).

supplied the means for WP&L to combat challenges from companies wanting to take their customers. In 1988, WP&L successfully fought off Sun Prairie Electric Cooperative, who tried to acquire a portion of WP&L's wholesale market. By using the team concept, management and labor at WP&L have joined together and improved operational efficiency and customer service ("Repositioning ..." 8).

Senior executives have seen the QC process as being a success for a number of reasons. The team sessions have helped the members to anticipate and prevent problems. Detailed discussions are held to determine all responsibilities, how the work will be performed and how to validate and check the end product. The result has been employees

at WP&L are planning their own work, interdepartmental projects are being completed on schedule and open communication has been established between management and labor. WP&L's management has seen morale rise significantly since employees are having a say in how the work is being done, resulting in a program everyone is happy with.

In today's competitve environment, customers are demanding more quality service for their dollar. Successful businesses are those that respond by managing work better. To ensure that future service needs are met, SRP's ongoing corporate objectives call for increased employee productivity. These increases can result from increases in employee utilization, efficiency and participation in decision making. The QC process has been developed as a productivity-improvement tool designed to support both crew utilization and efficiency through better planning and problem avoidance. The increase in efficiency results in harder and smarter work efforts. The end result is a crew's improved job completion performance.

QCs have become an important part of SRP's culture because they have been beneficial in many ways. Training employees in a problem-solving process helps them to direct their efforts toward improving their effectiveness. Circle members focus on understanding the customer's requirements and finding ways to meet these needs. By focusing on effectiveness, SRP has improved productivity and provided better service to the customer. Because of the group effort, ownership of solutions is increased, leading to easier implementation (Copp 46).

Quality improvement teams are used extensively at U.E. as a method to identify and solve work related problems. Throughout the company there is an enhanced awareness of the importance of quality. Many of the QC teams' solutions relate directly to achieving corporate goals and objectives. The QC process was established at U.E. in order to help U.E. compete in a competitive business environment and to prepare the company for its uncertain future.

The policies and conditions that shaped the way U.E. provided its services over the years are rapidly changing. The feeling at U.E. is that quality is a moving target. What is excellent today is mediocre tomorrow. The work processes that were "state of the art" or common industry practices 20 years ago are now obsolete due to the changes in world and market conditions. Top management believes that one of the biggest challenges is the ability to effectively handle these changes. The QC process is enabling the utility to respond quickly and anticipate change.

U.E. has already lost revenue through lost sales to competitors and renegotiated contracts to wholesale customers. The current regulatory issues focus on opening the industrial and commercial markets to competition. Competition is these areas could have a drastic effect on U.E. unless every employee works to meet these challenges. Upper management feels that the QC process provides a method and tools to meet these challenges ("Quality Improvement Process Manual" 8).

In examining these four utilities, it is apparent that senior management is concerned about deregulation and the changes that come with it. These top officials believe that their companies ability to deliver higher quality service at a reasonable rate will determine if their companies will retain their market share in a competitive environment. To accomplish this, there must be a commitment to quality by every employee. The utility executives see the development of the qulaity circle teams as the means to get employee "buy-in" and being the vital first step to ensuring the future of their corporations.

Chapter V

DISCUSSION

Various pressures are being experienced by the utility industry as customer expectations are rising. Technological advances require greater reliability, environmental concerns may affect the way service is provided and its price, and future capacity must be planned to meet the increasing load needs of their customers. As the utilities begin to focus on the needs of their customers, they must concentrate on improving the operations of individual work groups and how these changes are effecting the entire organization. Quality circles are providing a means to optimize work processes for the benefit of the internal and external customer.

The business environment in which utilities exist is creating many challenges for the industry. It is clear that the policies and procedures in place do not provide a path to meet these challenges. The changes in the utility environment demand quick responses by utility executives. Competition is here and utilities do not have the time to experiment with unproven quality improvement programs. The QC process has demonstrated that it is one of the most effective programs available with the ability to solve work related problems and help anticipate change. With competitive changes facing the industry, management must be less conservative and more willing to take risks. Through QC teams, companies are making planned, logical decisions about where to take risks and more important, how to mitigate them.

But management has to realize that quality is not free, it takes a lot of hard work and dedication. If management is serious about the QC process, then it must be willing to spend dollars and allow time for QC meetings. The utility must sacrifice for the short-term in order to reap the benefits of the long-term. Implementation of the process requires patience and recognition that it is a change in the management system. It is not just a program or package that brings about dramatic effects, but rather it is a long-term commitment aimed at making significant changes over a period of time. At FP&L, it took millions of dollars and several years to obtained measurable benefits. When the teams find problems, they make sure that the fix is integrated into the system instead of a short-term local solution. The top executives at FP&L were willing to commit to the process and have been rewarded with positive results.

Although the costs of a QC program can be added up, not all improvements can be measured in dollars and cents. QC teams are bringing management and employees together to review and investigate processes that do not support quality service or corporate goals. Top officials at WP&L feel that the QC process has given employees the training and tools to enable them to meet the challenge of competition. By introducing this management intervention, workers are now participating in making decisions and are working together to improve customer satisfaction. Each person employed by the company feels that each customer is his or her personal responsibility and that means better customer relations.

Because of the increasingly competitive nature of the utility industry, many companies have had to significantly reduce capital budgets. The goal is to lower the utility's costs by deferring non-essential new investments and reduce on-going operating costs. At SRP, the company has found that by increasing the effectiveness of its employees, it is doing a better job of meeting the customers' needs. Using the QC process has helped to focus the team members' effort on working smarter not harder. As employees were given more responsibility and discretion, SRP was able to reduce and eliminate administrative burdens, reduce layers of management and increase spans of control and accountability. Increased efficiency and better crew utilization has improved productivity and helped to curtail expenditures. Executives at SRP believe that the QC process has succeeded in preparing the utility for the uncertainties of deregulation.

Changing technology and customer expectations have created a different set of problems for utilities. Customers are demanding more reliable service, but they are not willing to bear rate increases. Even though the old standards for production and efficiency were good, competition calls for even better performance. U.E. is using the QC process to adapt the present work processes to those needed to satisfy the customers' changing needs. The process has also helped U.E. to anticipate and plan for the changing business environment. Senior executives at U.E. believe that to be successful, the company must be

ever mindful of the principle of continuous improvement, which means doing a better job of satisfying their customers. This company has found that the QC process has given the organization a systematic approach to the search for excellence.

Summary

Competition will be fought in the areas of price and service. The dramatic spread of QCs demonstrates that they are perhaps the most popular technique to achieve productivity improvement and attain greater customer satisfaction. The industry has realized that utilities do not have to look to the giants of the quality movement in the U.S. for new ideas that relate to work processes and customer relations. They have learned that the best authorities in these areas are their own employees.

Quite a lot of data suggests that the quality circle process can be an extremely valuable tool in nearly any organization. By allowing workers to become involved in the decision-making process, utilities are not only empowering the people close to the work, but are also developing employees that are highly skilled, efficient, motivated and well rounded. Through the QC process, companies are refocusing their energies around their customers as a part of their commitment to total quality throughout the organization. Management and workers are continually amazed at the value of the intrinsic rewards that accrue from participation in the process, as well as, the cost returns of QC activities.

An examination of these four investor-owned utilities has revealed that the companies are concerned about customer satisfaction. These corporations are committed to customer satisfaction in a cost-effective, safe and efficient manner. They have all implemented QC programs to find out how they can meet their customers' (both internal and external) needs. As a result of the recommendations by those teams, these organizations have already begun to make improvements in specific areas that are considered unacceptable to their customers. Research has demonstrated that quality circles can work because they deal with work-related issues in a manner that blends company and individual goals. From this, the utilities have begun to change how they are doing their business. This evidence leads to the acceptance of the hypothesis that through managing with quality circles, employees of an electric utility will become more productive in terms of increasing customer satisfaction while lowering operating costs.

Limitations

The evidence examined in this study points toward the successfulness of quality circles in preparing utilities for a competitive environment. Despite the large amount of descriptive and prescriptive promotional literature, there is a scarcity of QC theory and empirical work documenting the effectiveness of the process. Because of their recent introduction to utility management, comprehensive studies of this nature are, for the most part, nonexistent in this regulated industry. It would be possible to

examine studies of QC programs in companies with cultures similar to that of the utilities, but even the researchers see their findings as being inconclusive. Managerial decision makers must have reliable information on the potential of QC interventions within utilities if they are to make informed decisions regarding the merits of this process for their organizations.

Material for this study was taken from trade and business magazines. The technical literature dealing with this type of subjective appraisals are often prone to contain errors, biases and omissions. There are equally plausible arguments that the positive results of QC processes can be attributed to research using measures with uncertain reliability and validity. Poor performance measures will not reflect existing QC effects, even pronounced ones. Using objective measures to collect data on performance is likely to change some of the conclusions that rely on subjective indicators of performance.

Another limitation that could obscure the findings is that it is possible in research on change that nothing more than a Hawthorn effect has occurred. The employees perceptions and attitudes may have been altered because of increased attention, measurement or other factors rather than because of the QC intervention. The introduction of the process to an organization is usually accompanied with a tremendous amount of media promotion. This sudden interest in work processes may be the reason for the employees' initial effort at improving productivity. The newness of the QC process to utilities

has not allowed researchers the opportunity to determine if the effects on employees are permanent or if the change in attitude is just temporary.

As presently structured, most American QC programs rely primarily on self-gratifying rewards derived from participation and job enrichment, and secondarily on external reinforcement from various means of recognition. The lack of gainsharing reinforcement could have a major effect on QC members' motivation and desire to participate after the initial desire for autonomy has decreased. Researchers have described this as a so-called honeymoon effect. The QC teams examined individually were successful from the standpoints of both the participants and the organization for around two years but then began to decline. The material used in this study examined the QC program as a whole and did not take into consideration the productivity of newly formed teams versus the productivity of established teams.

Finally, the rather small sample size may severely limit the reliability of the study's findings. The low numbers could cast doubts as to how representative the results are to the entire industry. There are no statistics available as to what the extent of QC participation has occurred in electric utilities. In all likelihood, there are some companies with little or no participation by employees in the QC process, and others with a much higher level of participation. Therefore, the results of this study may be valid only

for organizations that have a high percentage of employees on QC teams.

Suggestions for Future Research

The QC phenomenon has been subjected to a very limited amount of legitimate research. It is clear that considerable future QC research is required before a reliable appraisal of the value of the process can be made. Although it appears that QCs may become the organizational intervention of the 90's, there is still research needed on practically every conceivable facet of these programs. In particular, there is a need for insight into the following areas: when QCs are most effective, how the extent of the effectiveness cycle can be increased, measuring costs and benefits accurately and the suitability of QCs for a variety of organizational cultures.

Such research would require lengthy studies where attitude and behavior can be observed over a period of time. Time is the key variable in evaluating organizational outcomes. Until recently, QCs have been used in a limited number of U.S. organizations, and most programs are still relatively new. Researchers believe that in large companies, it may take three to five years before these outcomes are discernible. To do justice to the quality circle process, evaluation research designs must be able to accommodate the maturational requirement of QC interventions.

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