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Total Quality Management Program Planning

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Metals and Ceramics Division

TOTAL QUALITY MANAGEMENT PROGRAM PLANNING

P. T. Thornton and K. Spence

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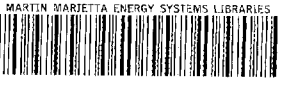

TABLE OF CONTENTS

LIST OF FIGURES

TOTAL QUALITY MANAGEMENT PROGRAM PLANNING*

P. T. Thornton and K. Spence

ABSTRACT

As government funding grows scarce, competition between the national laboratories is increasing dramatically. In this era of tougher competition, there is no room for resistance to change. There must instead be a uniform commitment to improving the overall quality of our products (research and technology) and an increased focus on our customers' needs. There has been an ongoing effort to bring the principles of total quality management (TQM) to all Energy Systems employees to help them better prepare for future changes while responding to the pressures on federal budgets (e.g., decreasing our costs, doing more for less, becoming more competitive, etc.). The need exists for instituting a vigorous program of education and training to improve quality, productivity, and communication. First, we must implement an understanding of the techniques needed to improve and initiate a change in organizational culture. The TQM facilitator is responsible for educating the work force on the benefits of self-managed work teams, designing a program of instruction for implementation, and thus getting TQM off the ground at the worker and first-line supervisory levels so that the benefits can flow back up (or rise as does a balloon). This program plan presents a conceptual model for TQM in the form of a hot air balloon. In this model, there are numerous factors which can individually and collectively impede the progress of TQM within the division and the Laboratory. When these factors are addressed and corrected, the benefits of TQM become more visible. As this occurs, it is hoped that workers and management alike will grasp the "total quality" concept as an acceptable agent for change and continual improvement. TQM can then rise to the occasion and take its rightful place as an integral and valid step in the Laboratory's formula for survival.

INTRODUCTION

As a national institution for scientific research and the development of leading-edge technology, Oak Ridge National Laboratory (ORNL) is constantly experiencing change. With the recent decline of the Soviet Union and subsequent reduction in defense spending by the

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federal government, Martin Marietta Energy Systems, Inc., the operating contractor for the Department of Energy's (DOE's) three Oak Ridge facilities, has experienced several downsizing efforts which have impacted all sites, including the Laboratory.

In an intense effort to secure new untraditional, non-government funding sources and respond to the pressures on federal budgets, ORNL has unabashedly stepped forward to engage in cooperative research and development agreements with national businesses and corporations, and continues to emphasize the transfer of technology from the scientific realm to private industry as a formula for survival. The Laboratory is also looking at any viable means of reducing its operating costs, e.g., doing more for less, to be more competitive with the other national laboratories and government contractors.

Within the Metals and Ceramics Division, there have been numerous changes, not all positive. Some have involved the loss of significant funding and staff, and the cancellation of vital research programs. As government money grows scarce, the competition between the national laboratories is increasing dramatically. In this era of tougher competition, there is no room for resistance to change.

STIMULUS

Management realized that for these cooperative arrangements to be successful, there must be a uniform, Energy Systems-wide commitment to improving the overall quality of our products (research and technology) and an increased focus on our customers' needs. Because "quality" is ultimately defined by the customer, our standards of performance must far exceed our customers' expectations.[1] Subsequently, there has been a dedicated, ongoing effort to bring the principles of total quality management (TQM) to all Energy Systems employees to help them better prepare for future changes and to reduce the mental and emotional stress normally brought about by change.

The need exists for instituting a vigorous program of education and training to improve communication and to help each employee develop a new awareness of the *need* for

improvement.[1] But, before implementing a "total quality" process, an understanding of the power of ***social systems*** (e.g., paradigms, sets of rules and regulations) and ***organizational culture*** is critical to breaking through the barriers to innovation and unlocking employee resistance to change.

BENEFITS OF IMPLEMENTING TQM

While TQM is a relatively new concept, it has been practiced at ORNL (without benefit of a label) for many years. The primary benefit of TQM is the development of an organization of quality-trained, motivated employees working in an environment where the managers encourage creativity, initiative, and trust.[1] This working environment, in turn, promotes an atmosphere where each individual's contributions are actively sought to upgrade quality, and are properly recognized and awarded—a ***win-win*** situation. Dr. Alvin Trivelpiece, Laboratory Director, defines TQM as "a total process that involves ***all*** staff in goal setting, empowerment, communication and teamwork, and continuous improvement and measures of excellence."[1]

HOW THE TQM PROCESS WORKS

Ultimately, the foundation of TQM is teamwork. For TQM to be successful, it is important to understand ***how*** the "total quality" process works. While there is a tendency to "detect and correct" problems, the foundation of TQM lies in ***prevention***. To prevent problems before they arise, managers must take an active leadership role in improving quality. This improvement can only become a reality through the use of ***empowered*** teams and individuals. When you empower individuals to perform their work and make decisions, they make an extra effort to improve the quality of their work. It is important for all employees to strive to work within the company policy, understand the impact of their individual actions on others, and earn the ***privilege*** to be responsible for their actions.[1]

While TQM tends to "trickle down" from the top levels of management to the worker level, its benefits flow back up (e.g., improved communication, increased customer and employee satisfaction, improved quality and productivity, synergism, cost savings, etc.).[1] While there has been an earnest effort by Laboratory management to bring TQM to fruition, it has not yet been brought to the first-line managers. Unfortunately, in a political arena, ***bureaucracy*** often suppresses the flow of information down to the appropriate levels.

TQM training must be provided to *all* employees, not just those in the top ranks. First-line supervisors and group leaders, who will ultimately be the most effective in the empowerment and problem-solving processes of TQM, should be the first recipients of training.

ROADBLOCKS TO IMPLEMENTING TQM

While management is more frequently criticized for opposing change and thwarting the progress of TQM, it is not just the managers who must change. Everyone in the TQM chain must be willing to accept more responsibility and accountability. This will require that we all move outside our normal comfort zones to address the problems we have often felt belonged to someone else.

Perception – One of the biggest impediments to implementing the TQM concept is perception. See the conceptual model for TQM in Fig. 1. With TQM, those supervisors and leaders accustomed to an authoritarian style are forced to grasp a new method of management that entails delegating more responsibility, authority, and accountability to the team members. These supervisors must learn to involve their employees to become more active in the decision-making and problem-solving activities of their work. This represents a threat to many of the "old school" managers. There is a general perception among supervisors that if they practice empowerment, they will relinquish some of their own power.[1] This bias prevents TQM from successfully getting off the ground and accomplishing its goals.

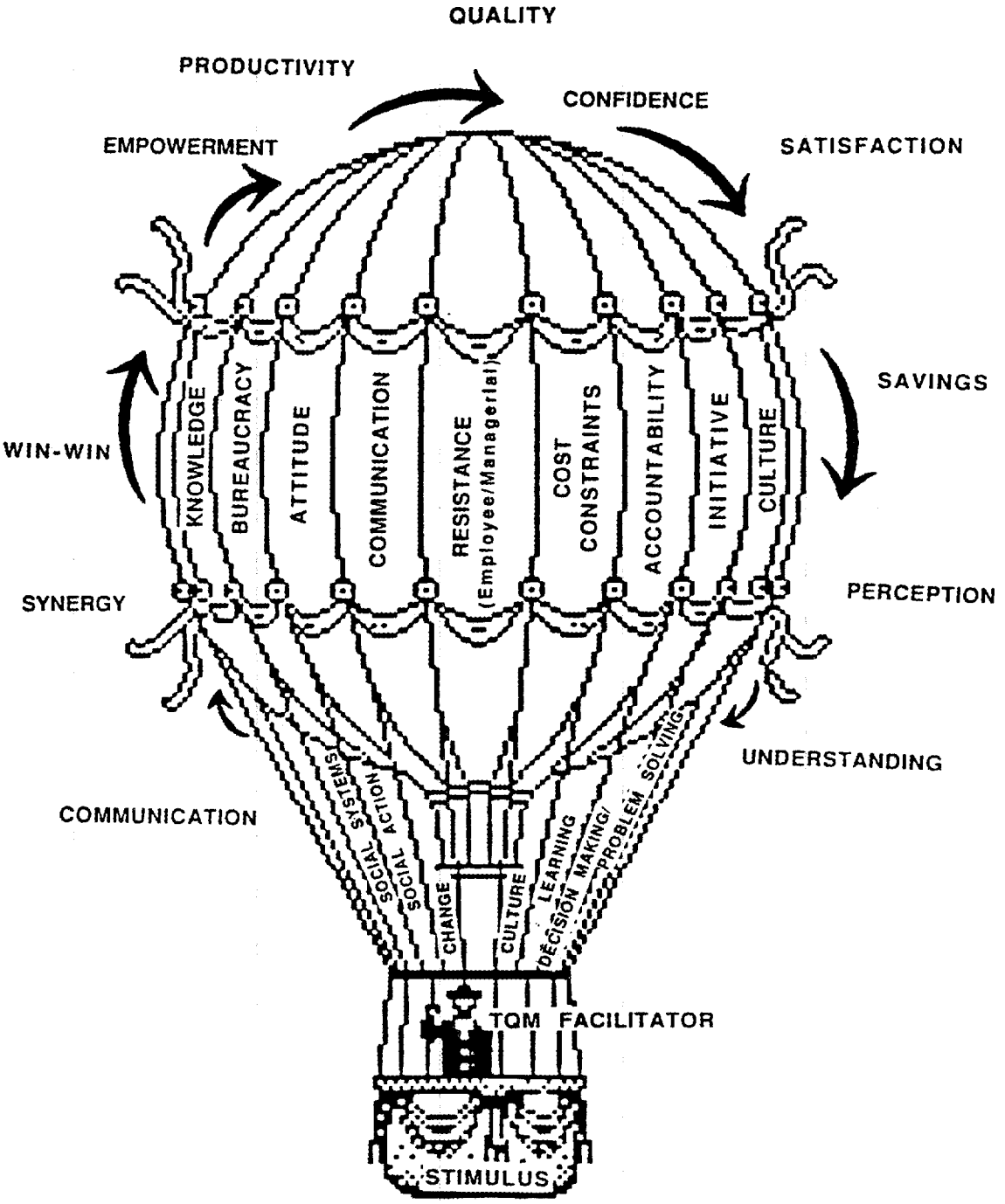

Fig. 1. Total quality management conceptual model.

Resistance – There also seems to be a resistance to, and lack of general management support for, TQM. Once the decision is made by these supervisors to empower their employees, management has to be supportive. It does little good to empower employees if middle and upper management "ride shotgun" such that the power given the employees is not real. This will take some "letting go" by upper management and more trust in the capabilities of the first-line supervisors.[1]

Attitudes – Teamwork starts with the attitudes and actions of a supervisor, director, or manager. It is impossible to have real teamwork unless each person is included and valued as an *essential* part of the group. To build a team, the members must know that what they are doing as individuals contributes to the team's success, and as the team succeeds, so do the individuals. "The path to greatness is always along with others" (Baltaser Gracian).[2] There is no room in the TQM process for "showboating" or "grandstanding."

Knowledge – Because there is often insufficient knowledge of the principles and benefits of TQM, there is an overall negative attitude toward its implementation. Management has failed to successfully communicate the "big picture" to lower-level staff. At the worker level, TQM is feared to bring on increased, unwanted responsibilities and *accountability* for problems or mistakes. The majority of workers feel that their supervisors should be held accountable for all problems, and a great many lack the *initiative* to be responsible for their own work or actions. Many workers simply have no desire to become involved in the *problem-solving* and *decision-making* processes and fail to see any personal gain.

In reality, an individual has much to gain when working successfully on a team. Teams decide their own tasks, hand out work assignments, and control the overall direction of the team. A team member has clear priorities and goals that are understood by all teammates. In a team, a person is free to openly communicate because this is encouraged and required. Working in teams promotes a climate of trust; it is the "glue" that holds the group together. There is also a general feeling among teammates that they can influence what happens. Members feel confident that they will be listened to by their leader and that

their ideas will be taken into consideration. Finally, learning to work effectively as a team in one unit has transfer potential for other situations.[2]

In the TQM process, managers encourage cooperation and a "team spirit" by stressing the connection between the team and the rest of the company. For a better understanding of the "big picture," team goals are discussed in direct relation to corporate objectives. TQM teams focus on "process" and ***evaluation*** as well as results. The customers' specifications (timing, cost, amount, accuracy, etc.) represent a continually changing template against which the team's results are measured.[3] Because TQM is a "living, breathing" process, it recognizes that customers' requirements are likely to change and allows room for adjustment—e.g., an output that meets requirements today may not be a quality output tomorrow.[3]

Brainstorming is vital to the "total quality" process.[3] TQM team members continually address such questions as: (1) How well are we functioning as a team? (2) What barriers are preventing us from being productive? (3) What can we do to become a more productive team?[2] With this constant questioning, evaluation, and re-evaluation process, as the team becomes more cohesive, the members acquire a clearer understanding of the team's current level of performance. They consequently improve their ability to isolate problem causes. The identification of problems and their causes leads into the problem-solving process and a systematic search for ways to solve them.[3] The team ultimately establishes "quality improvement" as a moving target. As a result, not only does the quality of the work, product, or service improve, but the team continually improves.

Cost – Another stumbling block to setting TQM in motion is the perceived cost. Most managers who are about to undertake a team-based change effort will ask two critical questions: (1) How can teams help accomplish the organization's goals, and (2) what are the potential risks?[2]

Through increased teamwork and the application of knowledge, skills, and "brain power" by the workers, higher productivity and improved quality of the product or service are achieved. Additionally, a lasting improvement in the capabilities of the workers

results from teamwork. There is an overall enhancement of employee dignity, ***confidence***, self-esteem, and ***job satisfaction***, and this increased self-assurance further enhances the team's ability to accomplish organizational goals more efficiently.[2]

The potential risks include: money, time, and effort may be invested with little return; the emotional strain of getting an organization to behave "differently" (change in ***culture*** and attitude); and creating employee cynicism when attempts are only half-hearted, or are not followed through.[2]

Historically, TQM teams have saved companies money. A good example of "effective" TQM is Japan's Honda Motors. The Japanese automaker had a team of its engineers work for one year with Cleveland-based Parker Hannifin Corp., one of Honda's chief suppliers. (This $2.4 billion manufacturer provides hydraulic valves and hoses, as well as seals, filters, and pumps, for just about every industrial application, including Honda's cars.) Honda's engineers worked in six Parker plants, coming up with efficiencies worth about $1.6 million a year. A lot of their suggestions for change were pretty basic. The main change was reorganizing the production line to reduce the number of times each part is handled and the amount of work-in-progress. The new layout cut the time it took a cylinder to travel through the line from 19 days to just under 5 minutes! Honda also trained nearly 70 Parker employees so that they can go into the company's other 153 plants and reorganize them without Honda's help. The reason for launching the supplier development program, as explained by Richard Mayo, the purchasing executive in charge of the initiative: "We want our suppliers to be better companies because, ultimately, that makes us a better company." While that's a very Japanese sentiment, it's also common sense.[2]

Honda is not the only company to recognize the benefits of the "total quality" process and of working in teams. Self-managed manufacturing teams at General Mills are 40 percent more productive than their counterparts at the company's traditionally organized plants. A billing problem that was costing Federal Express $2.1 million a year was spotted—and eventually solved—by company clerks at a weekly team meeting! The U.S. Army is now

assigning its G.I.s to teams for the entire tour of duty, an approach they found makes the infantry more productive, more reliable, and more committed to successful operations. Unquestionably, the "team" is becoming the competitive weapon of the 1990s.[2]

SUGGESTIONS FOR IMPLEMENTATION

In instituting a vigorous program of education and training to improve quality, productivity, and communication, we must first implement an understanding of the techniques necessary to improve and initiate a change in culture. There must be a systematic way to improve and a "*structures approach*" to identifying and solving problems. This will certainly not be an overnight cure for all "total quality" needs, but it is a logical start.[1]

The objective for a division-wide TQM training program is to provide supervisors and employees the insight to understand the dynamics of change and to enhance their ability to accept and view change more positively. To achieve this objective, the TQM facilitator must have an understanding of organizational culture and existing perceptions, paradigms, and attitudes. For example, the most common reaction to change is to resist it. Because most employees fight it too hard and too long, they tend to develop a myopia that precludes their ability to see any opportunities that may abound.[4] The workers, however, are not the only ones to resist change.

Self-directed work teams often fail due to resistance from supervisors who are afraid of losing their authority—or even their jobs. In the TQM process, it is important to engage supervisors in the process of organizing the work teams. Give them new responsibilities and explain how those responsibilities will shift during the team building process. Make them part of the process of change, rather than an obstacle to it.[2]

The TQM facilitator must understand the "cause and effect" relationship—that every change or problem in some way affects the social system. Because each problem or change involves collectives of people, its subsequent resolution involves collective behavioral changes.[5]

Before a change in organizational culture can be successfully instituted, employees and supervisors need to first understand what the issues are. They need sufficient time to understand the technical and economic criteria that are driving the change, and any decisions surrounding it.[4] They need to be able to see the "big picture." What is causing the changes to occur? What are the drivers and the significant opportunities? Where do they fit into the total picture?

Communication is vital to the success of a "total quality" program. Everybody wants to know what is going on. It is easy for managers to get so caught up in their daily battles that they fail to keep their people advised of what *they* know. Even if it's not much, just letting employees and lower level supervisors know what the managers know, or don't know, is vital to keeping them plugged into what's going on.[4]

In general, top management does not do enough to push strategic information down to the employees because they assume the material is not necessary for productivity.[2] However, in the team environment of TQM, the leader is responsible for keeping the team members informed. It is recognized that a team's ability to access information can impact its performance, so information is viewed as a vital resource to each member. With the exception of sensitive matters, the leader's files are open to all team members. Hence, TQM promotes open communication in an atmosphere of trust and mutual respect. Team members are encouraged to openly express their thoughts and feelings without fear of reprisal, and they feel free to ask questions with the confidence that they will receive honest answers. There are no hidden agendas; with TQM, everything is aboveboard.[2]

In addition, the TQM process encourages and supports continuous employee *learning* and training in appropriate skills, patience and support by management, rewards tied to results, and a desire to continuously improve and innovate through direct involvement in decision-making and problem-solving activities.

CONCLUSION

The conceptual model for TQM can be compared to a hot air balloon. The stimulus, or catalyst, for the program is the escalating need for the Laboratory to respond to the pressures on federal budgets (e.g., decrease our costs, do more for less, be more competitive, etc.) and to produce at a higher quality level. The desired outcome of reducing operating costs and improving overall quality is to continue to secure and maintain DOE funding for our research efforts, to save employee jobs, and to further secure the future of the Laboratory through nontraditional partnerships and collaborative arrangements with private industry.

The TQM facilitator, or change agent, ultimately has the responsibility for educating the work force on the benefits of self-managed work teams and implementing a "total quality" process, designing a program of instruction for its implementation, and thus getting TQM off the ground at the worker and first-line supervisory level so that the benefits can flow back up (or rise as does a balloon).

In the conceptual model, the factors that negatively influence and impede the progress of TQM within the division, and the Laboratory as a whole, include: employee and managerial resistance, lack of communication, bureaucracy, insufficient knowledge of the principles and benefits of TQM, cost constraints, attitudes and perceptions, worker fear of accountability, lack of initiative to accept increased responsibility, and instituting a change in culture (getting the organization to behave "differently").

Individually, and collectively, these internal factors prevent TQM from successfully getting off the ground and accomplishing its primary goal, the development of an organization of quality-trained, motivated employees working in an environment where the managers encourage creativity, initiative, and trust—a working environment which promotes an atmosphere where each individual's contributions are actively sought to upgrade quality and are properly recognized and rewarded.

As these negative influences are appropriately addressed and corrected, or improved upon, the many benefits of TQM (which include increased productivity, improved quality, enhanced employee self-confidence, improved customer and employee satisfaction, improved communication and increased knowledge, improved public perception, employee empowerment, continuous employee learning and training, synergism, win-win environment, cost savings, etc.) should become more visible. As this occurs, it is hoped that workers and management alike will grasp the "total quality" concept as an acceptable agent for change and continual improvement through goal setting, empowerment, communication, teamwork, continuous evaluation, and measures of excellence that seek to involve ***all*** employees as an indispensable part of the "total" process. TQM can then rise to the occasion and take its rightful place as an integral and valid step in the Laboratory's formula for survival, and those cynics and adversaries who have fought so long and hard to resist TQM will finally come to realize that it is more than just "hot air" blowing down from the top.

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