

2

AIR FORCE



**HUMAN
RESOURCES**

AD-A215 808

**TOTAL QUALITY MANAGEMENT: AN APPLICATION
IN A RESEARCH AND DEVELOPMENT LABORATORY**

Herbert J. Clark

**SPECIAL PROJECTS OFFICE
Brooks Air Force Base, Texas 78235-5601**

**DTIC
ELECTE
DEC 23 1989
S B D**

**December 1989
Final Technical Paper for Period December 1988 - September 1989**

Approved for public release; distribution is unlimited.

LABORATORY

**AIR FORCE SYSTEMS COMMAND
BROOKS AIR FORCE BASE, TEXAS 78235-5601**

89 12 27 005

NOTICE

When Government drawings, specifications, or other data are used for any purpose other than in connection with a definitely Government-related procurement, the United States Government incurs no responsibility or any obligation whatsoever. The fact that the Government may have formulated or in any way supplied the said drawings, specifications, or other data, is not to be regarded by implication, or otherwise in any manner construed, as licensing the holder, or any other person or corporation; or as conveying any rights or permission to manufacture, use, or sell any patented invention that may in any way be related thereto.

The Public Affairs Office has reviewed this paper, and it is releasable to the National Technical Information Service, where it will be available to the general public, including foreign nationals.

This paper has been reviewed and is approved for publication.

HAROLD G. JENSEN, Colonel, USAF
Commander

REPORT DOCUMENTATION PAGE			Form Approved OMB No. 0704-0188	
Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188), Washington, DC 20503.				
1. AGENCY USE ONLY (Leave blank)		2. REPORT DATE December 1989		3. REPORT TYPE AND DATES COVERED Final Report - December 1988 to September 1989
4. TITLE AND SUBTITLE Total Quality Management: An Application in a Research and Development Laboratory			5. FUNDING NUMBERS PR - 9981 TA - 03 WU - 90	
6. AUTHOR(S) Herbert J. Clark				
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Special Projects Office Air Force Human Resources Laboratory Brooks Air Force Base, Texas 78235-5601			8. PERFORMING ORGANIZATION REPORT NUMBER AFHRL-TP-89-58	
9. SPONSORING / MONITORING AGENCY NAME(S) AND ADDRESS(ES)			10. SPONSORING / MONITORING AGENCY REPORT NUMBER	
11. SUPPLEMENTARY NOTES				
12a. DISTRIBUTION / AVAILABILITY STATEMENT Approved for public release; distribution is unlimited.			12b. DISTRIBUTION CODE	
13. ABSTRACT (Maximum 200 words) In September 1988, the Air Force Human Resources Laboratory (AFHRL) took initial steps to set up a Total Quality Management (TQM) program in the laboratory. The implementation procedure used was the Method for Generating Efficiency and Effectiveness Measures (MGEEM). This procedure focuses on satisfying customer requirements, identifying Key Result Areas (KRAs), and tracking progress in those KRAs through Mission Effectiveness Indicators. This report outlines how TQM was implemented in AFHRL, and describes the lessons learned in the process. Lessons learned address: TQM versus Total Quality Control (TQC), applying TQM in an R&D organization, sustaining TQM, process action teams, and the acceptance of MGEEM as a method for implementing TQM. The survey feedback intervention technique, the confrontation meeting, and work teams are recommended for establishing TQM in an R&D organization. These procedures allow both managers and workers to develop a sense of ownership in the TQM process. This in turn increases the likelihood of sustaining the program and insuring its long-term effectiveness.				
14. SUBJECT TERMS			15. NUMBER OF PAGES 24	
			16. PRICE CODE	
17. SECURITY CLASSIFICATION OF REPORT Unclassified		18. SECURITY CLASSIFICATION OF THIS PAGE Unclassified		19. SECURITY CLASSIFICATION OF ABSTRACT Unclassified
				20. LIMITATION OF ABSTRACT UL

**TOTAL QUALITY MANAGEMENT: AN APPLICATION IN A
RESEARCH AND DEVELOPMENT LABORATORY**

Herbert J. Clark

**SPECIAL PROJECTS OFFICE
Brooks Air Force Base, Texas 78235-5601**

TABLE OF CONTENTS

	Page
I. INTRODUCTION	1
II. IMPLEMENTING MGEEM	1
III. TRAINING	2
IV. STATUS: AUGUST 1989	3
V. LESSONS LEARNED	5
VI. CONSIDERATIONS FOR THE CORPORATE BOARD	8
VII. THE FUTURE OF TQM IN THE DOD AND AT AFHRL	9
REFERENCES	10
APPENDIX A: AIR FORCE HUMAN RESOURCES LABORATORY TOTAL QUALITY MANAGEMENT TRAINING PLAN	11

LIST OF TABLES

Table	Page
1 AFHRL Key Result Areas (KRAs)	3
2 AFHRL Indicators	4

Accession For	
NTIS GRA&I	☒
DTIC TAB	☐
Unannounced	☐
Justification	
By _____	
Distribution/	
Availability Codes	
Dist	Avail and/or Special
A-1	

TOTAL QUALITY MANAGEMENT: AN APPLICATION IN A RESEARCH AND DEVELOPMENT LABORATORY

I. INTRODUCTION

In September 1988, the Commander of the Air Force Human Resources Laboratory (AFHRL) announced to his senior staff that he wanted to implement Total Quality Management (TQM) in the laboratory. His action was in response to the Department of Defense (DOD) endorsement of TQM (Secretary of Defense, 1988) and reflected his desire to achieve maximum laboratory research and development (R&D) productivity and quality. Like other commanders, he believed there was room for improvement in the organization and chose TQM as the means for achieving that improvement.

Before announcing his intention to implement TQM, the Commander requested that colonels and GM-15 employees at AFHRL read *Out of the Crisis* by Deming (1982), and give him comments on how Deming's 14 principles could be applied at AFHRL. These replies were discussed in general terms at a staff meeting, as were the management philosophies of Crosby (1984) and Juran (1988). There was also a briefing by an AFHRL scientist on the "Methodology for Generating Efficiency and Effectiveness Measures (MGEEM)," a set of management technologies developed at AFHRL (Tuttle & Weaver, 1986), which incorporate many of the tenets of TQM as espoused by Deming.

Following the briefing and considerable discussion, the Commander decided that MGEEM would be the tool AFHRL would use to implement TQM. Had there been a vote, it is unlikely that a majority of the staff would have endorsed implementing either TQM or MGEEM at AFHRL. The commander's decision was clear, however, and one division chief volunteered to be the first to implement MGEEM in his division. It was easiest for him to do so because one of the scientists who developed MGEEM was in his division. That division chief also seemed to genuinely endorse the TQM philosophy.

By employing MGEEM, and adhering to the 14 Deming principles to the degree possible, the Commander intended to increase the quality of laboratory R&D, improve communications, foster teamwork and morale, and increase customer satisfaction.

II. IMPLEMENTING MGEEM

The next step in the evolution of TQM at AFHRL was to have "off-site" meetings of all AFHRL senior staff members in Houston, Texas (November 1988) and San Antonio, Texas (December 1988). It was at those meetings that the staff (division chiefs, office directors, technical directors, and the Commander and Vice Commander) went through the MGEEM process of: defining the mission, identifying customers, developing key result areas (KRAs), selecting Mission Effectiveness Indicators, and developing Mission Effectiveness (ME) charts. ME charts are a derivative of the traditional Statistical Process Control Charts (Deming, 1982), and have subjectively determined feasible best and feasible worst mission effectiveness points. KRAs (Tuttle & Weaver, 1986, p. 14) are "measurable facets of an organization's mission," and Mission Effectiveness Indicators are the "measurement tools used to know if KRAs are being accomplished" (p. 22).

The off-site facilitator who guided the group through the MGEEM process was an AFHRL scientist who participated in the original development of MGEEM. Each of the two off-site meetings lasted 3 days, during which there was much discussion and disagreement. Out of

the meetings, however, came a list of 10 KRAs and 5 indicators which each division chief agreed to use, as appropriate.

In addition to implementing MGEEM at AFHRL, the group also established three Process Action Teams (PATs). These teams were to study known problems and provide recommendations for solving them. One team addressed shortening purchase request processing time and improving work unit management procedures. Another focused on shortening technical publication processing time. A third concentrated on improving the Human Resources Laboratory Management Information System (HRMIS). The HRMIS team was an existing working group, which the Commander designated a PAT at the conference.

There was a third off-site conference in February 1989, at Ft. Sam Houston, Texas, and a fourth in June 1989, at Lackland AFB, Texas. At the February conference, each division chief briefed his proposed ME charts. Then the group discussed indicators, indifference points for the ME charts, and the effectiveness of TQM at AFHRL. Although the same facilitator was used at the February meeting as at the December meeting, the Commander played a much larger role at the February meeting. In essence, he served as the facilitator during the last half of the meeting. This was a necessary step, since a non-directive approach did not resolve the many disagreements that arose. There was no facilitator for the June meeting, since it was a Commander's review of the MGEEM status, rather than a continuation of the MGEEM process.

Major results of the last two off-sites were: (a) The group selected three common indifference points for the five ME indicators (Customer Satisfaction, Quality, and Timeliness); (b) an additional PAT was established to improve timeliness and reduce paperwork and levels of review in purchasing Automated Data Processing (ADP) software and hardware; and (c) the Commander requested that each division prepare and submit ME charts to him every other month.

The Commander approved the KRAs and indicators proposed by the divisions to track their MGEEM progress, and these KRAs are shown in Tables 1 and 2. These tables show which of the 10 KRAs and 5 indicators the division chiefs used in implementing MGEEM at the division level. Laboratory obligation and expenditure rates were also used as indicators of performance. They were tracked and reported to the Commander by the Technical Programs and Resources Staff Office of the laboratory.

The AFHRL staff offices did not prepare ME charts. The Commander decided that, initially, MGEEM would address only productivity with respect to outside customers. Thus, the KRAs focused on the divisions' responsiveness to their outside customers. The role of the staff offices was to participate on PATs, administer TQM training, participate on the TQM Steering Group, and track obligation and expenditure rates.

III. TRAINING

During the MGEEM implementation period, everyone at AFHRL received training in TQM and MGEEM. The Human Systems Division (HSD), the parent organization of AFHRL, arranged TQM training for all HSD executive-level personnel (Colonel/GM-15). That training was given at Brooks AFB, Texas, by the Process Management Institute of Minneapolis, Minnesota, in March 1989. It centered on the Deming philosophy, and the course lasted 3 days. An AFHRL scientist who participated in the development of MGEEM gave TQM and MGEEM training to all AFHRL personnel. His presentation lasted about 2 hours. He also trained 50 HSD facilitators. This 40-hour course lasted 5 days, and focused on Deming, Juran, Crosby, Peters, MGEEM, and PATs. Other members of AFHRL attended an Air Force Institute of Technology (AFIT) course

held at Brooks AFB. It lasted 3 days and covered Deming, Juran, and Statistical Process Control (Shewhart, 1931). An AFHRL TQM Training Plan that was prepared in August 1989 is in Appendix A.

Table 1. AFHRL Key Result Areas (KRAs)

	KRA	Division ^a
1.	State-of-the-Art Training Analysis, Design, Delivery, Management, and Evaluation Techniques.	ID, LR, MO, OT
2.	State-of-the Art Personnel Management Tools and Supporting Materials.	MO
3.	Technical Information for the Weapon Systems Acquisition Process	MO, LR
4.	Human/Information Systems Integration Techniques	LR
5.	Maintenance Aiding Methods	LR
6.	Modeling, Simulation, and Decision Support Techniques	MO, LR
7.	Aircrew Performance Measurement Techniques	OT
8.	Automated Reliability, Maintainability, and Safety Systems Engineering/Design Techniques	LR
9.	Visual Research	OT
10.	Research Data Bases	SC

^aID: Training Systems Division.

LR: Logistics and Human Factors Division.

MO: Manpower and Personnel Division.

OT: Operations Training Division.

SC: Information Sciences Division.

IV. STATUS: AUGUST 1989

Senior Managers' Assessment. Most senior managers at AFHRL have reservations about the KRAs and Indicators selected. As stated by one division chief, "We really don't have a Lab MGEEM or TQM program. Each division has been left pretty much to do their own thing--something I thought we were trying to avoid." That division chief also said that "Our KRAs and Indicators were developed in a vacuum, with no user or higher headquarters inputs. We may think they are important--I'm not sure anyone else does." Others expressed concern that the indicators were too subjective and too insensitive to changes in KRA performance. Some even felt that the MGEEM process was a "waste of time," and that we were not seriously adopting the TQM philosophy because we were so busy attending to higher headquarters taskings that we had no time for internal laboratory discussions and brainstorming--key ingredients

in improving laboratory quality and productivity. Although most members the Senior Staff were positive about TQM and PATs, no one was enthusiastic about MGEEM. The most positive response to MGEEM was a wait-and-see attitude.

Table 2. AFHRL Indicators

Indicator	Division ^a
1. <u>Publications:</u> Counted whenever an article is published in a peer-reviewed journal, conference proceedings, book, technical report, technical paper, or special report.	ID, LR, MO, OT
2. <u>Presentations/Briefings:</u> Counted when given to a Colonel (06) or civilian/industry equivalent, or above, from outside AFHRL.	ID, LR, MO, OT
3. <u>Timeliness:</u> The ratio of milestones met to the total milestones scheduled for that period.	ID, LR, MO, OT, SC
4. <u>Customer Satisfaction:</u> Determined by each Branch Chief based on input from the work unit scientists. Final judgment on the rating is made at the Division level.	ID, LR, MO, OT, SC
5. <u>Technical Quality.</u> Based on criteria within each KRA used to evaluate performance at certain scheduled milestones. A milestone is evaluated by specific technical performance criteria. Whenever it involves a decision point, demonstration or a deliverable. The criteria vary according to the milestones. The division technical director is the division focal point.	ID, LR, MO, OT, SC

Commander's Assessment. The Commander's assessment of progress was outlined in a memo to all divisions and staff offices in August 1989. In it, he made several points, based on the division ME charts for May and June 1989, and the trend of the ME charts from February to June 1989. (In essence, the majority of the ME indicators were above the indifference point over the 5-month reporting period, thereby indicating satisfactory performance.) The following are excerpts from the Commander's memo.

1. All senior managers should have the same TQM data as the Commander. To ensure this, the Commander directed that all MGEEM charts and TQM memos sent to him be distributed to each division chief and staff office director.

2. "The MGEEM process can induce/facilitate a rational discussion to formalize who we are, what we do, and how to tell when we are achieving our purpose. The KRAs and metrics associated with them are limited only by our combined ability to generate them and make them meaningful for the task at hand. In other words, while possibly cumbersome, it is not the basic notion at fault but rather our ability and skill at implementation."

3. "I am becoming convinced that the PAT is the most likely point of proof of the whole TQM concept, the place where the culture for generating and instituting change is most likely to reside. We, therefore, must assure that PATs are on a stable and supported track. I see more effective communication and resultant understanding on specific problems coming out of PATs than much of the rest of formal or informal communication. The critical key for senior management is to see that PAT recommendations get expeditious review, resourcing, and implementation. The essential tie-across that still bears seeking is between the actions sought by the PAT and the measures of merit (KRA scores) we have selected to track."

4. "Training in TQM concepts is beginning to have some effect. At least we have a general sharing of principles. We have a long way to go and may always have significant differences in our individual perception of what to do to best implement TQM or to gauge the progress of such implementation."

5. "I am encouraged by the progress to date. I am confident that we have a lot of improvements to make and that the process will take several years to complete, but that it can make satisfactory payback as we go."

V. LESSONS LEARNED

Since TQM is now being started in many DOD organizations, the following lessons learned may be useful to them. The emphasis is on alternative ways to implement TQM, and the discussion is by topical area to make it easy for the reader to go directly to the subject of interest.

Total Quality Management (TQM) versus Total Quality Control (TQC). Although all of the off-site attendees endorsed the Commander's goal of achieving maximum laboratory quality and efficiency, several of the attendees, plus many people at lower levels of the organization, were not in favor of implementing a TQM program at AFHRL--particularly an MGEEM program. They believed that TQM and its associated statistical process control methodology were unsuited for an R&D laboratory that does not have the typical "processes" so commonly found in a manufacturing organization. And MGEEM, with its subjectively determined upper and lower limits and indifference points, did not set well with those scientists who felt that such measures were artificial and not effective in getting at the heart of R&D productivity. Measuring creativity and quality in R&D productivity, it was said, is a far cry from measuring the reliability or variability in transmission parts in an automobile manufacturing plant. Others felt that TQM and MGEEM were simply resurrections of Management by Objective or Zero Defects (Crosby, 1979), old programs which quickly passed away as their sponsors moved on.

What should have been clarified during the initial discussions of TQM was the distinction between TQM and Total Quality Control (TQC). TQM is concerned with the *management* of quality. TQC is concerned with the *control* of quality and the associated use of statistical tools, such as statistical process control. TQC has been used most frequently in controlling quality in manufacturing. TQM is a broader concept that encompasses the total management of the organization. It is more closely related to the organization development (OD) concept (Clark, 1989) than is TQC. Manufacturing organizations, such as the Ford Motor Company, have evolved from a TQC orientation to a TQM orientation. For them, the meaning of 'quality' has changed from a narrow focus on product engineering and manufacturing to a more comprehensive approach of making improvements in everything done, not just design, engineering, and manufacturing (Schroder, 1989, p. 574). So, though it may be true that TQC cannot be applied in all organizations, TQM can.

Application of TQM in an R&D Organization. TQM has been defined as:

... continuous process improvement activities involving everyone in an organization--managers and workers--in a totally integrated effort toward improving performance at every level. This improved performance is directed toward satisfying such cross-functional goals as quality, cost, schedule, mission need, and suitability. TQM integrates fundamental management techniques, existing improvement efforts, and technical tools under a disciplined approach focused on continuous process improvement. The activities are ultimately focused on increased customer/user satisfaction (Stimson, 1988, p. 2).

Probably no one at AFHRL would disagree with this definition of TQM, or say that TQM should not be practiced. The problem has been one of convincing them that an AFHRL program is required, and getting them to agree as to which program to adopt (e.g., Deming, Juran, or Crosby).

Prescriptions for implementing specific TQM programs vary. Deming has the least specific implementation plan. Juran and Crosby provide much more systematic and clearly defined plans. Juran proposes team problem-solving projects organized around an eight-step breakthrough sequence. Crosby advocates a 14-step company-wide quality awareness and improvement approach. Deming places his greatest emphasis on the requirement that managers continually improve work processes through statistically monitoring those processes. Juran assigns the major responsibility for quality improvement to problem-solving teams.

Juran teams are expected to find solutions to specific problems selected by top management on a yearly basis. The Juran approach places greater emphasis on specific problem removal than on general continuous process improvement. The Crosby approach attempts to systematically develop an individual commitment to quality improvement within each level of an organization. Although management is perceived as having the greatest impact in quality improvement, the attitudes and contributions of workers are specifically addressed in the Crosby approach (Houston, Shettel-Newber, & Sheposh, 1986, p. 8).

Which approach should be selected is an organizational decision. There is no simple prescription. However, a team approach (Juran) coupled with an individual commitment to quality (Crosby) may be the most readily accepted approach in an R&D organization. It may also prove to be the most lasting and effective approach. A successful implementation of the team approach at the NASA Lewis Research Center has recently been reported by the Office of Management and Budget (1989).

Sustaining TQM. There are several factors that can help ensure that TQM is sustained in an organization. One is a sense of ownership by both managers and workers in the new procedures adopted. A way of establishing such a sense of ownership is to institute TQM through a "confrontation meeting" (Beckhard, 1967). This consists of a 1-day meeting of the entire management, during which they take a reading of their own organizational health. The group then generates information about its major problems, analyzes the underlying causes, develops action plans to correct the problems, and sets a schedule for completing remedial work.

To help management define its major problems, an attitude survey is often given to everyone in the organization. The data are then fed back to working groups for analysis, interpretation, and recommended actions. French and Bell (1984) refer to this as the "Survey Feedback Intervention Technique" and describe specific procedures for optimally employing surveys. Likert

(1967) has developed a typical survey that could be employed. It is usually administered by an outside consultant or facilitator. The results are then fed back to management and the working groups.

The merits of the Survey Feedback technique, coupled with the confrontation meeting and the workshops, are (a) problem identification is based on survey data; (b) members of the organization (top management and working groups) define the problems and propose solutions, thereby giving them a sense of ownership in the process; and (c) the survey data can be used as a reference point for later surveys that may be given after changes have been made. Though the focus of the survey is traditionally on organizational climate and communications, it can also focus on organizational processes.

In essence, for TQM to be sustained, organizational problems must be clearly defined; management and workers must participate in the problem definition; and the TQM implementation plan must be jointly developed so everyone can develop a sense of ownership in the actions taken. The confrontation meeting and the Survey Feedback Intervention Technique are useful techniques in achieving these goals.

Process Action Teams. Six months after the implementation of TQM at AFHRL, the Commander believed that the most promising TQM results came from the PATs. Most of the senior managers agreed. Lessons learned about PATs are:

1. PATs need TQM training and a charter which outlines their responsibilities and the responsibilities of management regarding PATs. Annex C of Appendix A describes those responsibilities. This outline of responsibilities was particularly useful in clarifying the responsibilities of the PAT chairman and the PAT sponsor. (The PAT sponsor is the laboratory Corporate Board member who sponsors the PAT.) The role of the division chief in supporting PATs and being aware of PAT activities through the PAT chairman also needed to be emphasized. Each PAT member was trained as shown in Appendix A, Annex A. A laboratory TQM expert briefed all PATs on the tools of TQM (statistical process control, Pareto charts, etc.), and everyone in the laboratory was briefed on TQM and MGEEM. Recommended reading materials for PATs are Crosby (1984), Deming (1982), Peters (1987), and Stimson (1988). Each offers guidelines on team building.

2. PAT members should be volunteers and experts in the process being studied. Several people at AFHRL participated on the PATs, and they served well.

3. Management should take prompt action on PAT recommendations and advise the members which recommendations have been adopted and why. Frequently, actions are recommended based on inadequate information. Feedback to the PAT can insure that they are aware of constraints that stand in the way of implementation. Feedback should be in writing. Verbal feedback often results in various interpretations and non-uniform implementation procedures. The new written procedures should be distributed to the Corporate Board for comment, and the signature of the Commander.

4. Whenever possible, team members should be co-located. AFHRL has three widely separated operating locations; so, this was not possible. As a result, PAT meetings were infrequent. Ideally, meetings should be held at least monthly, if only by teleconference, after the team has met face to face at least twice. Peters (1987, p. 216) has stressed that good communications are essential for team success and cites "daily meetings and brief, written status reports, circulated to everyone" as key ingredients in team success. He also advises that customers become partners in team activities. Many times solutions to problems lie in the hands of customers or collateral organizations. These people should be made part of the

team. It is often necessary to shift from an adversarial relationship to a cooperative relationship, and team interaction is an excellent forum for doing that.

5. In establishing PATs, the focus should be on changing the culture of the organization, not just on fixing specific problems (Crosby, 1984, p. 10). This, of course, assumes that the culture *needs* to be changed. This can be determined only through a survey or some other form of systematic data collection.

Acceptance of MGEEM. MGEEM has not yet been fully implemented at AFHRL. KRAs and indicators have not been established at all branch levels, and the developers of MGEEM stress that this step is necessary for full implementation and a fair test of MGEEM's effectiveness. The initial reaction to MGEEM by most AFHRL managers, however, has not been favorable; and, if given the choice, they would not implement MGEEM at the branch level. If implementation at the branch level is *directed*, it is unlikely that it will be sustained. Without a personal sense of ownership, the program will very likely be dropped at the first opportunity. Management's hope has been that the payoff of the MGEEM process would become clear in the process of trying it out. That has not yet been the case. Nevertheless, MGEEM has given a focus or direction to the TQM process at AFHRL, and has developed an awareness of the TQM philosophy throughout the organization.

It may be that the unfavorable reaction to MGEEM is a result of having selected the wrong KRAs and the wrong indicators. The KRAs are very broad, and the indicators could be measuring inappropriate dimensions of laboratory effectiveness. For example, simply counting the number of publications never tapped the real publications problem--namely, slow administrative processing. Additionally, the MGEEM process may focus too much on collecting mission effectiveness data, and too little on solving known problems. These considerations and the finding that people report there is too little time to devote to TQM will be discussion topics at the next off-site in October 1989. Only when TQM can be viewed as a normal part of all activities, rather than as a separate activity, will a cultural change have taken place at AFHRL. This may require a management approach more similar to the one advocated by Crosby (1984).

VI. CONSIDERATIONS FOR THE CORPORATE BOARD

The AFHRL Corporate Board should consider the possibility that the attitudes expressed regarding MGEEM are really general attitudes against redirecting resources from the R&D program to other activities. Additionally, most divisions believe they are doing a good job and already have an effective division quality management program.

Given these conditions, some observers have concluded it is management's responsibility to direct the continuation of TQM/MGEEM. It is management's job to lead. The dilemma, unfortunately, is that such directed action will very likely lead to the dissolution of TQM once current management leaves. Exactly that occurred when a previous AFHRL commander abolished a set of "management indicators" which had been directed by his predecessor.

Another dilemma for the board is that directing or forcing new management initiatives on people runs counter to the humanistic philosophy underlying TQM. Yet, delaying action until consensus occurs could result in a continued conservative course of action and the contention that management failed to lead.

VII. THE FUTURE OF TQM IN THE DOD AND AT AFHRL

As of August 1989, the future of TQM in the DOD has been placed in jeopardy. At that time, a House Appropriations Committee cut \$100 million from the fiscal year 1990 defense appropriations, charging DOD "is rushing into TQM without well-defined training and implementations plans." As reported by Laurent (1989, p. 2) in the *Federal Times*, "The action will virtually shut down TQM efforts and will reduce or eliminate all other executive training, according to the draft of a DOD appeal directed at the Senate Appropriations Committee." The DOD appeal, with Office of Management and Budget (OMB) support, will be considered during a September House-Senate conference.

The future of TQM at AFHRL will be assessed in October 1989 at a Corporate Board off-site conference. The "going in" position from the Commander's perspective, as related in his July 1989 memo, is that TQM/MGEEM should be continued. He reports that the PATs are working well and that MGEEM can work effectively, for "it is not the basic notion at fault, but rather our ability and skill at implementation." The outcome of the October meeting and subsequent events will be reported in the future.

REFERENCES

- Beckhard, R. (1967, March-April). The confrontation meeting. *Harvard Business Review*, 45, pp 149-155.
- Clark, H.J. (1989, April). *Organization development: Concept, process, and applications in the Department of Defense* (AFHRL-TP-88-60, AD-A208 246). Brooks AFB, TX: Special Projects Office, Air Force Human Resources Laboratory.
- Crosby, P.B. (1979). *Quality is free* (pp. 132-139). New York: McGraw-Hill.
- Crosby, P.B. (1984). *Quality without tears*. New York: McGraw-Hill.
- Deming, W.E. (1982). *Out of the crisis*. Cambridge, MA: Massachusetts Institute of Technology, Center for Advanced Engineering Study.
- French, W., & Bell, C.H., Jr. (1984). *Organization development: Behavioral science interventions for organization improvement*. Englewood Cliffs, NJ: Prentice-Hall.
- Houston, A., Shettel-Newber, J., & Sheposh, J.P. (1986). *Management method for quality improvement based on statistical process control: A literature and field survey* (NPRDC-TR-86-21). San Diego, CA: Naval Personnel Research and Development Center.
- Juran J.M. (1988). *Juran on planning for quality*. London: Collier MacMillan Publishers.
- Laurent, A. (1989). DOD "quality management" imperiled by house panel action, *Federal Times*, 25(28).
- Likert, R. (1967). *The human organization: Its management and value*. New York: McGraw-Hill.
- Office of Management and Budget. (1989). *Quality improvement prototype*. Unpublished document available through the NASA Lewis Research Center, Cleveland, Ohio.
- Peters, T. (1987). *Thriving on chaos*. New York: Alfred A. Knopf.
- Schroder, R. G. (1989). *Operations management: Decision making in the operations function*. New York: McGraw-Hill.
- Secretary of Defense. (1988, March 30). Memo for the secretaries of the military departments; Subject: *Department of Defense Posture on Quality*. Washington, DC.
- Shewhart, W.A. (1931). *Economic control of quality of manufactured product*. Van Nostrend. (Reprinted from American Society for Quality Control, 1989)
- Stimson, R.A. (1988). *Total quality management: A guide for implementation* (EMHART/ATI OPM Work Order No. 8035-001, Contract No. 87-9035, Draft, 2/15/89).
- Tuttle, T.C., & Weaver, C.N. (1986, November). *Methodology for generating efficiency and effectiveness measures (MGEEM): A guide for Air Force measurement facilitators* (AFHRL TP-86-36, AD-A174 547). Brooks AFB, TX: Manpower and Personnel Division, Air Force Human Resources Laboratory.

APPENDIX A: AIR FORCE HUMAN RESOURCES LABORATORY
TOTAL QUALITY MANAGEMENT TRAINING PLAN

AIR FORCE HUMAN RESOURCES LABORATORY TOTAL QUALITY MANAGEMENT TRAINING PLAN

INTRODUCTION

This document contains the Air Force Human Resources Laboratory (AFHRL) Total Quality Management (TQM) Training Policy. It provides the information necessary to make informed decisions about TQM training requirements.

TRAINING REQUIREMENTS

Implementation of TQM requires that training and education be provided to all personnel at AFHRL. Consequently, managers and supervisors must ensure that personnel are available for scheduled training. TQM training varies from basic "awareness" training for everyone to education of selected personnel in TQM philosophy and the management techniques of the Methodology for Generating Efficiency and Effectiveness Measures (MGEEM). This training is spread over a long period, and requires a sustained high level of effort for several years. Even after TQM has been successfully implemented, there is a need for on-going training, especially for new employees.

The training identified in this document provides all personnel the necessary training appropriate to their level in the organization. Training requirements for personnel at AFHRL are tabulated in Annex A. These charts show which courses are "Required" and which courses are "Beneficial" for the various levels of the organization. Training identified as priority 1 is "Required." Training identified as priority 2 is "Beneficial," but not required.

RESOURCES

Instructors

1. The high costs of contractor TQM training makes it necessary to use in-house training resources whenever possible. Accordingly, internal AFHRL facilitators must train new division personnel once they have received initial training. Continuation training for division personnel is also the responsibility of the division or staff office facilitator/focal point. Each facilitator should take the initiative to conduct briefings, training, or distribute a TQM newsletter, as appropriate. The facilitator should also advise the Process Action Team (PAT) after the team has received its initial PAT training and the facilitator has received facilitator training. Each facilitator must train his or her replacement in the responsibilities of serving as division TQM facilitator. Responsibilities of PAT members, the PAT chairman, the PAT sponsor, the AFHRL division chiefs, and the TQM steering group are described in Annex C.

Facilities

2. All AFHRL conference rooms may be used for TQM training. TQM books, articles, and video tapes are available in the AFHRL Brooks library. Space should be reserved at the AFHRL Operations Training Division, Williams AFB, Arizona, and the Logistics and Human Factors Division, Wright-Patterson AFB, Ohio, for TQM study and for distributing TQM literature. TQM books will be mailed periodically to Williams AFB, Arizona, and Wright-Patterson AFB, Ohio, for use by division personnel. All books should be placed on reserve and personnel advised of

their availability. TQM references now available at the AFHRL Brooks library, the Logistics and Human Factors Division, and the Operations Training Division are listed in Annex B.

Funds

3. To ensure that adequate funds are available for TQM training, each division and HQ AFHRL will reserve a portion of its annual budget for TQM training and travel. The proportion to be reserved will be determined by the respective division or staff office chief. HQ AFHRL will *not* reserve a separate TQM fund for distribution to the divisions during the fiscal year.

Scheduling Training

4. Each AFHRL division chief and office director is responsible for scheduling the training required for his personnel. The division TQM focal point advises the division chief of course availability. Training requirements directed by HQ HSD or HQ AFHRL is scheduled by the AFHRL Special Projects Office.

Arrangements for obtaining the training listed in Annex A are made by contacting the "Sources" listed in Annex A. Contact your local Civilian Personnel Office to attend the Deming, Juran, or DSMC courses. Other courses may be attended at the division's option. Required training should be completed during the first quarter the new employee is on station.

Training Plan Maintenance

5. This training plan will be amended annually, in October, to reflect circumstances as they change. It is updated by AFHRL/SA and coordinated with the AFHRL TQM Steering Group (Corporate Board) to insure that all training requirements are appropriate. The HQ AFHRL focal point for TQM training is the Special Projects Office (SA), AV 240-3169.

ANNEX A

TQM Courses		Source
A.	TQM/MGEEM Familiarization for all personnel	Division: As designated by the Division Chief
B.	TQM Facilitator Training	Division: As designated by the Division Chief
C.	TQM Process Action Team (PAT) Training	Division: As designated by the Division Chief
D.	AFIT Quality Management Workshop, QMT 84	Air Force Institute of Technology, Dr. R.A. Di Lorenzo, AV 785-7776
E.	Executives: How to Put the Deming Philosophy to Work in Your Organization Tuition: \$595.00	Civilian Personnel Office
F.	Facilitators: Juran Quality Improvement Tuition: \$2,500.00	Civilian Personnel Office
G.	DSMC Senior Management Workshop in TQM	Civilian Personnel Office

TQM TRAINING PLAN

Course	A	B	C	D	E	F	G
Top Management	1			1 ^a	1 ^a		1 ^a
All Personnel	1						
Facilitators		1		2		2	
PAT Members			1	2			

Priority

Meaning

1

Essential training for this position.

2

Beneficial. Provide when possible.

^aTop Managers (Colonels/GM-15) must attend one of these courses within first 6 months on station.

ANNEX B

- Clark, H.J. (1989). *Organization development: Concept, process, and applications in the Department of Defense* (AFHRL-TP-88-60, AD-A208 246). Brooks AFB, TX: Special Projects Office, Air Force Human Resources Laboratory.
- Crosby, P.B. (1979). *Quality is free*. New York: McGraw-Hill.
- Crosby, P.B. (1984). *Quality without tears*. New York: McGraw-Hill.
- Deming, W.E. (1986). *Out of the crisis*. Cambridge, MA: Massachusetts Institute of Technology, Center for Advanced Engineering Study.
- French, W., & Bell, C.H., Jr. (1984). *Organization development: Behavioral science interventions for organization improvement*. Englewood Cliffs, NJ: Prentice-Hall.
- Gitlow, H.S., & Gittlow, S.J. (1987). *The Deming guide to quality and competitive position*. Englewood Cliffs, NY.
- Ishikawa, K. (1982). *Guide to quality control*. Tokyo: Asian Production Organization.
- Juran, J.M. (1988). *Juran on planning for quality*. London: Collier MacMillan Publishers.
- Juran, J.M. (1988). *Juran's quality control handbook*. New York: McGraw-Hill.
- Peters, T. (1988). *Thriving on chaos*. New York: Alfred A. Knopf.
- Scherkenback, W.W. (1988). *The Deming route to quality and productivity*. Rockville, MD: Mercury Press.
- Tuttle, T.C., & Weaver, C.N. (1986). *Methodology for generating efficiency and effectiveness measures (MGEEM): A guide for Air Force measurement facilitators* (AFHRL TP-86-36, AD-A174 547). Brooks AFB, TX: Manpower and Personnel Division, Air Force Human Resources Laboratory.
- Walton, M. (1988). *The deming management method*. New York: Putnam.
- Weaver, C.N., & Looper, L.T. (1989). *Methodology for generating efficiency and effectiveness measures (MGEEM): A guide for the development and aggregation of mission effectiveness charts* (AFHRL-TP-89-7, AD-A208 353). Brooks AFB, TX: Manpower and Personnel Division, Air Force Human Resources Laboratory.

Responsibilities

Corporate Board (TQM Steering Group)

- Develops the vision for the organization and establishes corporate goals.
- Identifies critical processes that need priority attention.
- Establishes TQM PATs at lower levels to focus on functional and cross-functional improvement efforts.
- Identifies and provides resources necessary to support TQM.
- Provides review and oversight of TQM progress.
- Takes action on problems and recommendations referred to them by the PATs, by providing direction to the PAT chairman.
- Designates a member sponsor to each PAT.

PAT Sponsor

- Serves as an intermediary between the PAT and the Corporate Board.
- Facilitates coordination of PAT activities with internal and external organizations.
- Supports/encourages PAT members.
- Provides input to PAT chairman on agenda development and process analysis.
- Establishes/encourages intra-divisional PATs, as necessary.
- Advises PAT chairman what actions are necessary to implement Corporate Board decisions.

Process Action Team Chairman

Manages the Process Action Team to include:

- Arranging PAT meeting facilities
- Assigning specific actions to other PAT members.
- Establishing an agenda before each meeting.
- Establishing, following-up, and maintaining a schedule.
- Preparing written status reports for each PAT meeting.
- Briefing the Corporate Board on PAT status and recommendations.
- Taking actions necessary to insure Corporate Board's directions are implemented (e.g., preparing letter for CC signature, delegating duties to other PAT members).

Process Action Team Member

- Conducts process analyses using TQM tools (e.g., cause-and-effect diagrams).
- Targets specific processes that need improvement.
- Reports status of PAT actions to division chief.

TQM Focal Point

- Serves as division/staff office focal point for TQM activities.
- Responsible for coordinating TQM activities within a division, between divisions, and with HQ AFHRL.

TQM Facilitator

- Knowledgeable person at division or staff office responsible for providing TQM training to personnel within the division. This training includes PAT training, general TQM training, and MGEEM training.

Division Chief

- Supports the activities of Process Action Teams. Insures that sufficient time and funds are allocated to allow all division PAT members to participate in PAT activities. Maintains full awareness of PAT activities and provides counsel on request.