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Pathfinding on the Continuous Journey
Total Quality Management (TQM) in the Department of Defense

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PATHFINDING ON THE CONTINUOUS JOURNEY

Total Quality Management (TQM) in the Department of Defense

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ABSTRACT

Total Quality Management (TQM) is a body of management theory and practice based upon the fundamental idea that quality products and services can only be produced by quality organizations. Although widely accepted in the private sector, it has a mixed record.

The paper inquires into the applicability of TQM to Department of Defense (DOD) activities considering the inherently more confining environment than that found in the private sector.

The general conclusion is that DOD is in the early phases of a broad evolution in management theory and practice. TQM offers the opportunity for significant improvement but its adaption is destined to be a slow and often painful process.

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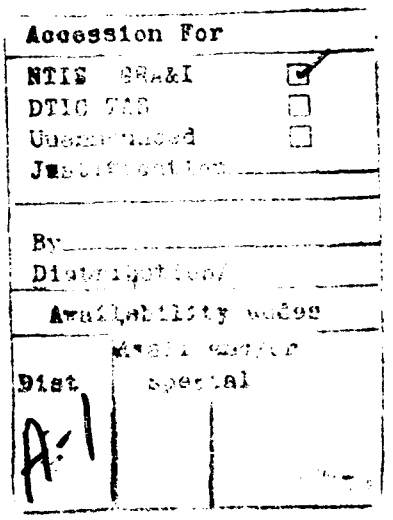

PATHFINDING ON THE CONTINUOUS JOURNEY

Total Quality Management (TQM) in the Department of Defense

Cure-all or Catchword?

"What's the big deal about TQM? It's only common sense," asserted an Army brigadier general recently, as he dismissively waved his hand. "Flavor of the Month," an Air Force officer derisively tossed off in response to my question of how TQM had worked in the Air Force Logistics Command. "I don't believe in TQM...," said a four-star chief of one of the armed services recently. "TQM... has stumbled badly over its early, inflated expectations, " Jay Mathews says in a September, 1992 *Newsweek* article. He concludes "American firms may not... embrace (TQM) until it makes their shareholders more money than it did the seminar organizers, consultants and book publishers, who reaped the biggest quality rewards of the 1980s."[1] In an open letter printed in the November-December, 1991 *Harvard Business Review*, the CEOs of American Express, Ford, Xerox, Proctor & Gamble, Motorola and IBM collectively asserted, "...we are absolutely convinced that TQM is a fundamentally better way to conduct business and is necessary for the economic well-being of America."[2]

The foregoing validates Bob Arndt's assertion that, "Unless you come from another planet, you have heard of TQM and probably have a strong opinion about it."[3] It further demonstrates that the opinions are far from unanimous or even in general agreement. With what has been referred to in various places as the *American Quality Renaissance* now in its second decade, one can find support in a rapidly growing body of literature for his opinion, whatever it may be. There has been time for success... and

for failure. Since 1988, implementation of TQM has been a publicly stated top priority of The Department of Defense (DOD). [4] Yet, it is obvious that saying so has not made it so. An October 1992 General Accounting Office (GAO) survey of DOD and other federal activities, discovered uneven application. Strikingly, even the organizations considering themselves to be advanced in application, reported, on average, twenty-five percent employee involvement.[5]

The goal of this study is to draw general conclusions concerning the suitability of TQM as a management philosophy and set of operating principles for DOD activities. Information was drawn from a wide variety of sources including books on management theory and practice, professional quality and business journals and general periodicals, interviews with officers of the various military services, and as a "reality check," interviews with key personnel of the Defense Fuel Supply Center (DFSC), an element of the Defense Logistics Agency which is now about eighteen months into an attempt to implement TQM. The resulting correlation and synthesis of information will be presented in the following order:

- Origin, characteristics and theoretical underpinnings of TQM.
- Suitability to various types of endeavors: manufacturing, service, government.
- Applicability in DOD
- TQM at DFSC
- What will the future bring?

Imported From Japan but Made in America

TQM began to take hold in enclaves in the United States in the late '70s and accelerated in the '80s when it finally became clear that Japan's ability to beat America in the marketplace could not be attributed to "cheap labor."[6] Japanese products, particularly in the auto, consumer electronics, and optics industries not only were cheaper than their American competition but were also more reliable, more durable and reflected close attention to human engineering. The Japanese went to great lengths to determine what their customers wanted, then provided it. Threatened with the loss of virtually entire industries, the United States went on a "quality kick." American managers logged millions of *business-class* seat-miles between the U.S. and Japan attempting to understand the "Japanese Miracle."[7] The American management lexicon expanded to include such words and phrases as *Quality Circles, Just-in-time, SPC* (Statistical Process Control), and *Kaizen*, the Japanese word that translates roughly as "improvement". In various ways and places, the ideas behind the terms also found their way into American management practices. [8]

The most shocking and far-reaching discovery, however, was that the Japanese attributed much of their success to two American management theorists and this discovery finally brought W. Edwards Deming and Joseph M. Juran to prominence as prophets in their homeland.[9] Along with Deming and Juran, a third notable contributor to the quality movement has been Philip B. Crosby who had worked entirely in the U.S.[10] As the quality movement has gained momentum, others have come to prominence. In general, though, their contributions have taken the form of restatement,

elaboration or synthesis of the ideas of Crosby, Deming and Juran. The Federal Quality Institute (FQI) identifies these three and a fourth, William E. Conway, as "America's Quality Coaches."[11] Conway was president and chairman of Nashua Corporation when he invited Deming to help improve quality there in 1979. He has since established a quality consulting firm, founded upon Deming's teachings and his own experience. Each of these gentlemen has developed a unique and self-contained set of theories and strategies designed to promote quality in an organization. An organization fully adhering to the guidance of any one of them can truthfully claim to be practicing TQM. Brief displays of the guiding principles promoted by each of these Quality Coaches may be found at appendices A-D.

Just what is this child of many fathers:TQM?

The phrase "Total Quality Management" was coined, not by one of the "Quality Coaches" but by a Department of the Navy behavioral psychologist.[12] (Interestingly, the Navy now terms its quality program "Total Quality Leadership".) Now widely accepted, the term is useful to those with a thorough understanding of quality management but defies definition for a newcomer to the quality conversation. In addition, the neophyte must learn an extensive new vocabulary. Definitions tend to be either multiple paragraphs covering the broad landscape of management thought; or brief, pithy and of no value to anyone who does not already possess a solid fundamental understanding. An example fitting the latter category is: "Involving everyone in an organization in controlling and continuously improving how work is done, in order to meet customer expecta-

tions of quality."[13] Beyond the fact that TQM represents a revolutionary change in direction of management thought and action, a major barrier to assimilation of the concept is that the new vocabulary consists of old and familiar words used with new meaning. As one executive pointed out, terms such as "cultural change" and "continuous improvement," while accurate descriptors, are difficult to comprehend when first encountered, simply because they condense many ideas and meaning into one or two words.[14]

The word "quality" itself, has, in the TQM lexicon, acquired new meaning which varies subtly among prominent authors.[15] Additionally, the concept of TQM goes far beyond simple questions of quality. Don Mizaur, the FQI Director, asserts that TQM is not really about quality but about improvement of underachieving organizations.[16] Indeed, Conway, Crosby, Deming and Juran, whatever their points of disagreement among themselves, are unanimous in declaring that effective quality management requires a profound change in "management culture."

TQM is a collection of tools, concepts and procedures, which if properly chosen and correctlv applied, will result in the optimal operation of a manufacturing or service organization. Its core objective is to provide the organization's customers with completely satisfactory products and/or services the first time, every time.[17] Output of such quality can only be achieved by an organization that is thoroughly healthy, enjoying internal teamwork throughout the organization, and in complete control of the processes which bring forth its output. It is the antithesis of Taylorist *Scientific Management*, changing both the *who* and *how* of organizational decision-making.[18]

TQM eschews opinion and visceral impulses as decision-making tools. It relies, instead, on statistical tools to identify problems and guide the search for solutions. Where appropriate, it applies statistical process control to establish and maintain control over internal processes.[19] Formalized feedback procedures are used to ensure that operations remain on course and to spot opportunities for improvement. A frequently cited example is the "Plan-Do-Check-Act (PDCA) Cycle," (also known variously as the Deming Cycle or Shewhart Cycle) which supports the goal of continuous, never-ending improvement. [20]

Group decision-making is highly valued in the TQM context.[21] Quality Circles, which hit the U.S. with great splash a decade ago and subsequently withered, largely because they were used as stand-alone worker motivation tools, can be an integral part of a TQM effort.[22] Process Action Teams (PATs) are also frequently features of TQM initiatives. PATs may be organized for the short-term purpose of accomplishing a special project or solving a single problem or they may remain in existence indefinitely to monitor and improve continuing processes.[23] PATs are usually multi-functional groups with membership representing all elements having a stake in their decisions. The same group is likely to include extensive representation from both the vertical and horizontal axes of the organizational chart. In addition to attacking particular problems and processes, PATs and similar groups perform the general function of helping to eliminate organizational barriers and facilitate communication.[24]

Empowerment is an important, but easily misunderstood TQM concept. It is not to be confused with anarchy in the workplace or abdication of management responsibili-

ty. Under TQM, employees remain fully accountable and are provided the training and the tools to make competent decisions governing their work. Through indoctrination in the organization's strategic vision and culture, they are encouraged to make decisions consistent with quality output.[25] Success of empowerment requires a high degree of reciprocal trust between workers and managers and a somewhat nontraditional concept of discipline. General John Yeosock, when commanding the 1st Cavalry Division, often described discipline as "Doing the right thing, even when no one is looking." Empowerment demands a culture with this kind of discipline. In effect, the worker is faced, not with a supervisor making periodic checks, but with the supervisor inside himself, who is *always* on the job.

The Quality Coaches identified by FQI are unanimous in their assertions that TQM cannot get off the ground in an organization without firm support of top management.[26] Without continued dedication and commitment, TQM will wither and die. They are as staunchly unanimous in their defense of the American worker, insisting that the worker has been the scapegoat for the failures of management. Dr. W. Edwards Deming asserts that, on average, eighty-five percent of the problems in an organization spring from the system, which is management's responsibility.[27] As he and others have frequently pointed out, nonsupervisory employees work *in* the system; management people work *on* the system.

Anyone who has ever been frustrated by the inconsistencies and inefficiencies of traditional bureaucracies is likely to feel a sense of liberation upon reading any of several excellent TQM references available. The overenthusiastic reader must, however,

impose on himself the knowledge that there are several things TQM is *not*. It is not a turnkey, instant solution; it is not easy, and it is not a program.[28] As Dr. Deming has often pointed out, "There is no instant pudding." After five years of introducing and implementing TQM, Ford Motor Company, despite some outstanding successes assessed themselves as having TQM only fifteen percent deployed.[29] Those who think the self-evident good sense embodied in TQM should make it easy to implement need to realize that while there have been some outstanding and highly public successes, two thirds of the companies in the private sector who have made attempts at implementing it have failed at least once. [30] TQM cannot be thought of as a program with a beginning, middle and end. In fact, the only TQM efforts which have *ends* are those that fail.[31] Yet another basic tenet is that of continuous improvement, the combination of steady refinement combined with technical innovation in an ever ascending spiral of better quality.[32] It must be a *continuous journey*.

Finally, TQM is not a "one-size-fits-all" system, and it is no cookbook. It must be tailored to the objective organization.[33] One of Western management's failures, according to Dr. Deming, is its search for examples as a route to success.[34] Attempting to follow another's example, he says. without understanding the underpinning theory will inevitably lead to disappointment. Each organization is unique (as is each person) and each must choose its unique way to pursue improvement. What works at one time and place may be totally wrong elsewhere. An example is the adaption in this country of specific techniques used in Japan, such as "Quality Circles" and "Kanban" (just-in-time delivery) with great fanfare... and their subsequent demise as the Hawthorne

Effect wore off .[35]

As already mentioned, TQM has not posted a record of unmixed success in the U.S.[36] Its successes have come in manufacturing, service, and in government organizations. It has met failure in the same types of places. There is a growing body of recently published literature highly critical of TQM. The more thoughtful and well-researched of pieces, though, fault not theory, but practice.[37] Just as there are apparently many routes to success with TQM, there seems to be a rich variety of ways to fail. The most frequently mentioned have been:[38]

- Lack of top management support and commitment.
- Lack of understanding of principle; attempt to follow a template.
- Using only part of the "toolkit" provided by TQM.

Good Enough for Government Work?

"The ideas of W. Edwards Deming," According to Bill Clinton, then Governor of Arkansas, "known in the Federal government as total quality management (TQM), and in Arkansas as quality management(QM)--have become a powerfully effective force for change in American industry. Primarily a force in manufacturing until recently, with appropriate adaptation QM offers the framework and the tools to be equally effective in government."[39]

If TQM is so difficult to effect in the private sector, what are its prospects for broad application across the Federal government and particularly DOD? To be sure, there have been DOD organizations which have made great progress in TQM. One suspects that there have also been failures but this is much more difficult to assess in the

government than in the private sector. In government agencies it is not uncommon, when a new idea comes along, to talk about it, fill out the forms, post signs, declare it "done" and get on with the next project. It would be surprising if this were not the case in many organizations which have declared themselves TQM practitioners.

There is no doubt that DOD organizations wishing to execute fundamental change find themselves in an inherently more difficult position than do private organizations. While private organizations are faced with an ever-increasing collection of laws and regulations within which they must operate, they are as free as eagles compared to DOD agencies. A private businessman would be horrified if he had to buy everything according to the Federal Acquisition Regulation, hire and manage his people under Office of Personnel Management (OPM) provisions, subject himself to an annual Inspector General (IG) inspection, and periodically entertain auditors of the GAO or DOD. Private organizations measure success economically. Measures of success in the government are often not clearly stated beforehand; they are discovered only after the occurrence of success or failure.

Similar to physicians who practice "defensive medicine," managers and commanders in DOD often find it advisable to practice "defensive management." Tending to fires and avoiding negative consequences often overwhelms tendencies to seek improvement. Relatively brief tenure of commanders and senior managers is even more magnified in DOD than in private industry and therefore the urge to take the short-term "not-on-my watch" view is even more likely to exist. The commander or agency head who sets out to institute TQM charts for himself or herself a difficult course with

uncertain prospects of success.

If, as Deming suggests, the system is the cause of eighty-five percent of organizational problems, the system is clearly the place to start in order to get the most benefit of improvement. A DOD manager who wishes to bring about fundamental, positive change in his organization must first assess how much of the system he can control. He will surely discover that he can fix considerably less than eighty-five percent of the problems without outside help.

Currently, with DOD being shrunk, restructured and partially dismantled, the progressive manager faces an additional bundle of disincentives for experimentation. The impulse to resist change, present in every bureaucracy, is exaggerated during a time of turmoil and great insecurity. The "Oh, what's the use" syndrome is an ever-present threat and there are numerous examples to support one who is inclined to adopt such an attitude. The agonizingly difficult and finally successful effort of instituting TQM at Alameda Naval Air Station, for example, was rewarded by closing the facility.

Still, despite the disincentives, DOD is full of people who naturally seek excellence and it has more than its share of managers and commanders who regard good work as its own reward.

Total Quality Management at Defense Fuel Supply Center (DFSC)

DFSC was chosen for inclusion in this study because it is currently pursuing a vigorous attempt to implement TQM and being headquartered locally, provided opportunities for direct observation and conversation with key managers.

TQM at DFSC dates from the beginning of the tour of the incumbent commander, Brigadier General Stephen M. Bliss. General Bliss, an Army Quartermaster officer and former commander of the 10th Mountain Division's Division Support Command was new to the wholesale logistics system when he arrived at Cameron Station in the summer of 1991. He recalls that during his initial interview with Lieutenant General McCausland, the Air Force officer who then commanded the Defense Logistics Agency, he heard the term "TQM" for the first time. General Bliss began reading and accumulating information on the new concept. But it was on a visit to Army's Aviation Systems Command (AVSCOM) in St. Louis where the swirl of new ideas began to crystallize. The AVSCOM commander was an enthusiastic supporter of TQM and credited its deployment with being able to meet the requirements of Desert Storm. Returning from St. Louis, General Bliss evaluated the organization he had inherited, (He found that the center had a strategic plan that said DFSC practiced TQM but its only evidence was on paper) General Bliss determined to make TQM a reality at DFSC.

What kind of an organization was this? Whether you wish to use number of people, range of responsibility, or dollars as counters, DFSC is a large organization. With less than a thousand people, (over ninety percent civilian employees) assigned, DFSC has worldwide responsibilities and has elements deployed, temporarily or permanently, around the globe. It is responsible for roughly forty percent of the Defense Logistics Agency (DLA) procurement budget and posts annual sales in the neighborhood of five *billion* dollars.[40]

Command of DFSC is rotated among the military services and its staff includes

across-the-board representation. DFSC's headquarters is organized into functional directorates and offices (see Appendix E). In addition, its major subordinate elements include seven Defense Fuel Regions. Four serve the continental U.S. Three overseas regions, one in Germany, one in Hawaii and one in Bahrain, provide worldwide support.

DFSC's mission is "To provide comprehensive worldwide support for the armed forces of the United States--the right fuel, the right quality, the right quantity, the right place, the right time, and the right price--and fuel support to other Federal Government agencies as authorized." Major elements of the mission include the following functions:

- Procuring fuels, including petroleum products, natural gas and coal, for the Military Services and other designated Federal agencies.

- Arranging for petroleum services, including leasing contractor-owned, contractor-operated terminals; securing contractors to operate some government-owned terminals; environmental assessment and cleanup; and inventory management at government-operated facilities.

- Coordinating bulk petroleum transportation via tanker, pipeline, barge, rail, and truck. The Center also determines the size and source of tanker cargoes lifted by the Military Sealift Command.

- Establishing policies and procedures for petroleum quality assurance and surveillance. DFSC employees perform quality assurance work overseas and quality surveillance functions within the Continental U. S.

- Procurement of crude and refined oil for the Strategic Petroleum Reserve

(SPR) and the Refined Petroleum Reserve, both of which are funded and operated by the Department of Energy.

- By autumn of this year, DFSC will have consolidated control of all bulk fuel in the DOD inventory. The Center will then be totally responsible for all fuel from point of purchase until delivered to the final customer (into a plane, truck, tank or ship). It is currently fielding an automated accounting system to handle this additional highly detailed workload.

DFSC has been one of the more stable elements of DOD for the past forty-five years, and one of the most successful. Designated the Armed Services Petroleum Purchasing Agency in 1948, it has had its name changed several times and added new lines to its inventory but has been performing basically the same function since World War II. Many of its senior managers have spent their entire career with the center. Many of its military members have served repetitive tours at DFSC. By all accounts, both internal and external, DFSC has performed its mission excellently. There is great general pride in its absolute avoidance of mission failure, a remarkable achievement considering the nature of its obligations.

What moved the new commander to initiate TQM in a proud organization with high morale and a reputation for excellent performance? Despite the organization's great self-esteem and excellent reputation, he felt that improvements could be made. Moreover, he realized that DLA was going to lose people in the continuing defense reduction and that DFSC would take its share of reductions. For DFSC, a smaller

defense establishment means a decrement in fuel demand but not necessarily a decrease in people requirements as the range of responsibility will remain unchanged, perhaps even grow. He saw two possible ways to compensate for the coming crunch between resources and requirements: Improvement in the center's management information system and TQM. The two complementary efforts would both be needed.

He also saw the down-side of organizational stability. DFSC was an organization set in its ways. Along with pride, complacent self-satisfaction grew from being a monopoly for over forty years with no credible competitor in sight. The directorates amounted to "fiefdoms" which avoided cross-directorate communication; parochialism and sub-optimization were rampant. His perception was similar to that of Joseph Sensenbrenner, the erstwhile mayor of Madison Wisconsin who cites a department head who told his middle managers he expected them to take care of quality problems while he "protected" the department from the rest of city government.[41]

A Continuous Journey Begins With a Single Step...

As General Bliss looked around he saw an organization whose top management thought everything was "just fine." They thought nothing was broken and therefore no fixing was required. He knew he had a challenge. Starting from scratch, despite the words on the "strategic plan", General Bliss began with a coup.[42] Discovering that the AVSCOM TQM coordinator was moving to Richmond with her spouse, he hired her and the effort was launched. He determined that he needed to follow what he calls a "twin-track" approach, pursuing:

- Continuous improvement of existing processes,

- Development of a strategic plan for the medium to long range, taking into consideration impending structural changes in DLA and feasible technological improvements, particularly in the area of information management.

Education was clearly the first priority. By its very nature, TQM cannot be effectively implemented simply by directing that it happen. It requires understanding and support throughout an organization. Success requires virtually everyone's participation; failure can be achieved through the agency of far fewer people. But while General Bliss knew that he could not dictate implementation, neither could he make it voluntary. He knew implementation by fiat would bring forth beautiful charts, graphs and high profile, time wasting programs; making it completely voluntary would keep it right where it was: on paper. He and TQM coordinator mapped out and began implementing the following general course of action.

- Establishment of a Quality Steering Council consisting of top managers and the Commander as chairman.

- Training of the Steering Council through an intensive two-week course presented by the TQM coordinator.

- Development of a revised mission statement by the Steering Committee.

- Off-site conference with customer representation to outline the strategic plan.

- Training of all supervisors in basic TQM techniques.

- Completion of strategic plan through participation of all managers.

- Working the plan.

To date, slightly more than seventy percent of all supervisors have undergone TQM training. The course, similar to that originally experienced by Steering Committee members, is two weeks in length. The first week consists of training in basic concepts and the use of statistical tools. During the second week of the course, the class is formed into a short-term Process Action Team (PAT). The group selects an organizational problem to attack and then does so using the skills learned the first week. This is considered serious business. Upon completion, the PAT presents its results to the Steering Committee which is chaired by the commander. A number of PAT recommendations have been implemented. Examples include[43]:

- Improved communications between Defense Fuel Regions and DFSC headquarters through acquisition of modernized equipment and streamlined procedures
- Creation of a guide to process identification
- A survey of mail distribution effectiveness at DFSC
- DFSC physical fitness program

Initially attempting to take on large projects, the "student PATs" quickly learned that they weren't through with school until they had completed their project. They have since tended to choose projects which they could reasonably complete in one week.[44]

The comprehensive strategic plan is nearing completion. To the bones of the

initial outline, the muscles of discrete tasks have been added. Writing of the tasks and plans for accomplishing them have been designated the responsibility of middle managers and supervisors. To date, approximately 120 tasks have been identified and incorporated into the plan. The process begins with assignment of responsibility to a manager. He/she forms a team including representation from all organizational stakeholders (anyone the task touches in a significant way), develops a plan of action and then briefs the Steering Committee which is, again, chaired by the commander. Upon approval, a "Champion" (person responsible for shepherding the task to complete implementation) is formally designated and the task becomes part of the strategic plan.

PATs, outside of training, have been formed for various purposes. Two notable examples are "Team-link," charged with bringing electronic information management fully on-line and another charged with developing a plan to reorganize DFSC to meet impending DLA structural changes and eventual move of the headquarters to Fort Belvoir.[45]

To Roll a Boulder You First Have to get it Moving...

Discussions with top officials at DFSC reveal a sense of frustration that things are not moving faster. Things are looking good on the input side; training is moving along satisfactorily, there is considerable activity, and TQM enjoys the commander's "relentless" support and participation. Yet, there are still those who are clearly taking a "this too shall pass" attitude. There are those who have learned the words but not the actions. There are those who retain the belief that they only need to give new names to

the same things they have always been doing and there are those that think "TQM stuff" is extra work. It is true that most of the improvement projects undertaken to date have been directed toward internal "quality of work life" issues and from the external customer perspective, there has been little discernable change.[46]

There is, however, room for optimism. There is a growing number of middle and senior managers who have adopted the sincere belief that TQM can and should make a positive difference. Familiarity with the "tools of the trade" is becoming more pervasive and as successful projects accumulate they give rise to new possibilities; the process has begun to feed on itself. The organization appears to be positioning itself so that it will be able to take on high-risk, high-dollar projects with far-reaching implications for the future. They appear to be approaching Deming's *critical mass*.

What of the future? The short answer is that its too early to tell. To some extent, DFSC, like the rest of the defense establishment remains hostage to forces of change beyond its control. At the very minimum, the intense scrutiny of internal processes they have executed will permit better decisions in the face of change, whatever its forms. There is no doubt that internal communication has improved and a higher degree of cross-functional expertise has developed.[47] These too, are significant new strengths. The key element of unpredictability remains the leadership. General Bliss will leave for another assignment this June. There is no guarantee that the next commander will approach TQM with the same sense of commitment. Senior DFSC officials, however, have learned that the commander-designee is an Air Force general with experience in the Air Force Logistics Command. This suggests, at a minimum,

that he will have had a great deal more exposure to the concept than General Bliss did when he arrived.

"TQM, What's That?"

Observation of the ongoing attempt to implement TQM at DFSC reinforces the impression gleaned from other sources, that TQM, as a separate management system, may be destined for the "junk-heap" of history. Management students of the future are likely to see it as a footnote in their texts, probably somewhere in the vicinity of *Scientific Management.* Why? Because it will likely have been assimilated into management thinking to the point that it will have lost its identity as a separate concept. The last two decades of the twentieth century, "The Age of TQM", may well be looked back on as a transitional period between the industrial age and whatever we will finally come to label its successor. TQM, in such an eventuality, will probably be regarded as the shorthand identifier for the collection of theory and resulting experimentation designed to transition managerially to the new age.

A great weakness of TQM aside from its lack of definitive precision, is that it rolls so easily off the tongue and too many people think because they can say it, they understand it. Their first impulse is to fit into the same category as other "programs" that have come along periodically, caused great excitement, and disappeared. Until this barrier of preconception can be pierced, TQM will have rough going.

Beyond convincing people that TQM is worthwhile lies the formidable task of teaching them *how*. The concepts require fundamental reorientation of thought,

something that not all people are capable of. As Dr. Deming has often said, "Doing one's best is not enough, it is first necessary to kno *what* to do."

In both the private sector and in government we are on the ascending arc of the TQM learning curve. The concept itself continues to evolve and is continually being enriched both by its successes and its failures. Wide acceptance in industry will support its widening acceptance in government. Business schools are beginning to move into research on and teaching of its principles. Successful managers and commanders of the future are likely to be doing TQM but they will probably be thinking of it simply as *managing*.

NOTES

1.Jay Mathews and Peter Katel, *Newsweek*, 7 September 1992 pp. 48-49.

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APPENDIX A
Deming Distilled

Dr. W. Edwards Deming, probably best known of America's quality leaders, has developed some shorthand indicators of his management method. Best known are his "Fourteen Points for Management." He provides further clarification with what he has titled "The seven deadly diseases," Western management practices that lead to failure. Finally, he describes some "obstacles" which are not so serious as deadly diseases but still stand in the way of total success. Far from sufficient to provide in-depth understanding of Deming's teachings. These distillations are provided here as background for the reader. In addition to Demiing's *Out of the Crisis*, The *Deming Management Method* by Mary Walton was used as a source for this appendix.

Deming's Fourteen Points for management

In *Out of the Crisis*, Deming says, "The 14 points are the basis for transformation of American industry. It will not suffice to solve problems big or little. Adoption and action on the 14 points are a signal that the management intend to stay in business and aim to protect investors and jobs. Such a system formed the basis for lessons for top management in Japan in 1950 and in subsequent years."

1. Create constancy of purpose toward improvement of product and service, with the aim to become competitive and to stay in business, and to provide jobs.

2. Adopt the new philosophy. We are in a new economic age. Western management must awaken to the challenge, must learn their responsibilities, and take on leadership for change.

3. Cease dependence on inspection to achieve quality. Eliminate the need for inspection on a mass basis by building quality into the product in the first place.

4. End the practice of awarding business on the basis of price tag. Instead, minimize total cost. Move toward a single supplier for any one item, on a long-term relationship of loyalty and trust.

5. Improve constantly and forever the system of production and service, to improve quality and productivity, and thus constantly increase costs.

6. Institute training on the job.

7. Institute leadership. The aim of supervision should be to help people and machines and gadgets to do a better job. Supervision of management is in need of overhaul, as well as supervision of production workers.

8. Drive out fear, so that everyone may work effectively for the company.

9. Break down barriers between departments. People in research, design, sales, and production must work as a team, to foresee problems of production and in use that may be encountered with the product or service.

10. Eliminate slogans, exhortations, and targets for the work force asking for zero defects and new levels of productivity. Such exhortations only create adversarial relationships,as the bulk of the causes of low quality and low productivity belong to the system and thus lie beyond the power of the work force.

11a. Eliminate work standards (quotas) on the factory floor. Substitute leadership.

b. Eliminate management by objective. Eliminate management by numbers, numerical goals. Substitute leadership.

12a. Remove barriers that rob the hourly worker of his right to pride of workmanship. The responsibility of supervisors must be changed from sheer numbers to quality.

b. Remove barriers that rob people in management and in engineering of their right to pride of workmanship. This means *inter alia*, abolishment of the annual or merit rating and of management by objective.

13. Institute a vigorous program of education and self-improvement.

14. Put everybody in the company to work to accomplish the transformation. The transformation is everybody's job.

The Seven Deadly Diseases

1. Lack of constancy of purpose.

2. Emphasis on short-term profits.

3. Evaluation of performance, merit rating, or annual review.

4. Mobility of top management.

5. Running a company on visible figures alone.

6. Excessive medical costs.

7. Excessive costs of warranty, fueled by lawyers that work on contingency fees.

Some Obstacles

1. *Neglect of long-range planning and transformation.*

2. *The supposition that solving problems, automation, gadgets, and new machinery will transform industry.*

3. *Search for examples.* (This refers to people trying to emulate the success of another organization based only on observations. Deming says you can certainly learn from others but knowledge must be based on theory. Otherwise you are likely to quickly lose your way.)

4. "*Our problems are different.*" (Often offered as excuse for failure)

5. *Obsolescence in schools.* Decries the emphasis on finance and creative accounting by America's business schools

6. *Reliance on quality control departments.* Quality control departments are typically equipped only to report history. They can provide greatly detailed information as to what failed but not why. Quality, Deming says, belongs in the hands of the people who have control of it:managers, supervisors, workers.

7. *Blaming the work force for problems.* Workers are responsible for only 15 percent of the problems, the system for the other 85 percent. The system is the responsibility of management. These astounding numbers are now, as evidenced by available literature, widely accepted.

8. *Quality by inspection.* Inspection can only find defective items after they have been produced, and paid for. It cannot, by itself, lead to prevention of quality problems.

9. False starts. This applies to the seizing upon of a management gimmick such as Statistical Process Control(SPC) or establishment of Quality Circles without the underpinning of a corresponding change in management philosophy. Both SPC and Quality Circles can be valuable parts of an overall quality improvement effort but neither will bring permanent improvement by itself.

10. *The unmanned computer.* Here, Deming decries the accumulation of data without concrete plans for its use.

11. Meeting specifications. The reduction of variability in any given system is central to quality improvement. Reliance on specifications rather than reduction of variation will be a roadblock to quality improvement.

12. *Inadequate testing of prototypes.* Testing of prototypes must include production engineers.

13. "*Anyone that comes to try to help us must understand all about our business.*" Mary Walton asserts that the Deming Management Method is universal. Deming says that it is possible to know everything about a business except how to improve it.

APPENDIX B
Concentrated Crosby

Philip B. Crosby came to national prominence with his first book *Quality Is Free*, published in 1979 while he was ITT's director of quality. His perspective is fundamentally different from Deming and Juran; his background is that of a quality professional and entirely in the U.S. He originated the "Zero Defects" concept. Although "Zero Defects" is now hardly ever said without an accompanying sneer, he argues that his original ideas were distorted by managers who failed to fully understand them. Instead of the management revolution he envisioned and continues to promote, he argues that DOD and others employed "Zero Defects" as a self-defeating worker motivation program. The following lists, while by no means comprehensive, provide some idea of the essence of Crosby's teachings. Information was drawn from Crosby's books *Quality Is Free* and *Quality Without Tears*.

Profile of a Problem Organization

1. The outgoing product or service normally contains deviations from the published, announced, or agreed-upon requirements.

2. The company has an extensive field service or dealer network skilled in rework and resourceful corrective action to keep the customers satisfied.

3. Management does not provide a clear performance standard or definition of quality, so the employees develop their own.

4. Management does not know the price of nonconformance.

5. Management denies that it is the cause of the problem.

Fourteen Steps of Quality Improvement

1. *Management commitment.* The management must promulgate a clear quality policy without, per Crosby, "weasel words," then senior managers must themselves personify the policy.

2. *Quality improvement team.* The quality improvement must include people with convenient access to top management.

3. *Measurement.* This is an especially difficult area for teams working on service quality but Crosby asserts that customers always measure in some way. It may take some digging but measures can be developed and they must be objective.

4. *Cost of quality.* An objective measure must be developed so that the entire cost of quality, rather than just the quality control department budget can be determined.

5. *Quality awareness.* Crosby advocates the spreading of quality information through the use of all available publication means including posters. While this seems to be in diametric disagreement with Deming's tenth point, it must be understood in the context of Crosby's entire program. With that in mind, the reader discovers the disagreement to be more apparent than real.

6. *Corrective Action.* Crosby cautions against reacting to the obvious. Effective corrective action relies on precise cause analysis. Often, the real cause of a problem will be discovered only after several tiers of analysis.

7. *Zero defects planning.* Experience has shown that improperly planned zero defects programs can be counter-productive. To be effective, "Zero Defects" requires commitment and action from all levels of the organization. If it is seen simply as worker motivation it will shrivel and die and leave a smelly corpse.

8. *Employee education.* Crosby joins Deming in railing against the practice of relying on employees "showing new people the ropes." Formal quality training must be included in new employee indoctrination. Otherwise, the message will inevitably be distorted.

9. *Zero Defects Day.* This is the day for management to "stand up and make its commitment in front of everybody in a way it must abide by."

10. *Goal setting.* Goals should be derived through quality team consensus and they must be major, not minor goals.

11. *Error-cause removal.* The quality team must devise a responsive system to react to errors identified by employees. The procedure must contain promptness and public feedback.

12. *Recognition.* Crosby, again at some variance with Deming, believes in individual awards for quality contributions. Selection for the awards, which are non-monetary, are made by organization-wide balloting with only the organization head being ineligible.

13. *Quality councils.* Obviously stemming from his professional experience is Crosby's desire to see quality councils formed to promote exchange of information. He realizes that quality professionals may not be immune to knee-jerk resistance to change and must therefore be brought on board.

14. *Do it over again.* Reminiscent of Deming's (Shewhart) Plan-Do-Check-Act cycle, this envisions quality improvement is an ever-ascending spiral.

The Four Quality Absolutes

1. *The Definition of Quality is "Conformance to Requirements."* The differences among Crosby, Juran and Deming relating to definition of quality are substantially different but careful reading allows reconciliation.

2. *The system of quality is prevention.* In league with Deming and Juran, Crosby denies the possibility of inspecting quality into a product or service, reinforcing the obvious, but seemingly subtle point that a correctly conceived and executed process cannot fail to produce quality. As Crosby says, "The error that does not exist cannot be missed."

3. *The performance standard is zero defects.* You will get at least as many defects as you plan for.

4. *The measurement of quality is the price of nonconformance.* The price of nonconformance is the cost of doing everything that would not have to be done if everything had been done right the first time.

APPENDIX C
Joseph M. Juran

Joseph M. Juran has written extensively about quality and quality improvement. The ten steps below provide the outline of the method taught at the Juran Quality Institute. Juran insists that quality improvement must come project by project. He asserts that there is no such thing as improvement in general. The following ten steps are cited in The Federal Quality Institute *Federal Total Quality Management Handbook.*

Juran's 10 Steps to Quality Improvement

1. Build awareness of the need and opportunity for improvement.

2. Set goals for improvement.

3. Organize to reach the goals (establish a quality council, identify problems, select projects, appoint teams, designate facilitators).

4. Provide training.

5. Carry out projects to solve problems.

6. Report progress.

7. Give recognition.

8. Communicate results.

9. Keep score.

10. Maintain momentum by making annual improvement part of the regular systems and processes of the company.

APPENDIX D
William E. Conway

A graduate of both Harvard and the Naval Academy, William E. Conway was president and chairman of Nashua Corporation when he discovered Dr. Deming. He has since founded his own quality consulting firm. Solidly founded on Deming's teachings, Conway's "Tools for Quality Improvement" reflect a wedding of theory to lifelong management experience. Information for this Appendix was gleaned from the Federal Quality Institutes's *Federal Total Quality Management Handbook*.

Conway's 6 Tools for Quality Improvement

1. Human relations skills--the responsibility of management to create at every level, among all employees, the motivation and training to make the necessary improvements in the organization.

2. Statistical surveys--the gathering of data about customers (internal as well as external), employees, technology and equipment, to be used as a measure for future progress and to identify what needs to be done.

3. Simple statistical techniques--clear charts and diagrams that help identify problems, track work flow, gauge progress, and indicate solutions.

4. Statistical process control--the statistical charting of a process, whether manufacturing or non-manufacturing, to help identify and reduce variation.

5. Imagineering--a key concept in problem solving, involves the visualization of a process, procedure, or operation with all waste eliminated.

6. Industrial engineering--common techniques of pacing, work simplification, methods analysis, plant layout and material handling to achieve improvements.

APPENDIX E

Defense Logistics Agency

DEFENSE FUEL SUPPLY CENTER