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APPLICATION OF THE DEMING
MANAGEMENT METHOD TO
IMPLEMENT TOTAL QUALITY
MANAGEMENT IN THE DOD

THESIS

Shawn P. Lyman, P.E.,
GS-12

AFIT/GLM/LSQ/91S-43

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DEPARTMENT OF THE AIR FORCE

AIR UNIVERSITY

AIR FORCE INSTITUTE OF TECHNOLOGY

Wright-Patterson Air Force Base, Ohio

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THESIS

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Abstract

This study looked for DOD logistics organizations using the Deming management method to implement TQM. A total of 21 organizations were identified that claim to be following Deming. These organization were then questioned on what they are dong to implement the Deming philosophy. Each organization is presented and their program discussed. The techniques being used in the different TQM programs were then classified and presented according to each of the 14 points.

APPLICATION OF THE DEMING MANAGEMENT METHOD TO IMPLEMENT TOTAL QUALITY MANAGEMENT IN THE DOD

I. Introduction

Background

On 18 August 1988 former Secretary of Defense Frank C. Carlucci made Total Quality Management (TQM) a part of the Department of Defense (DOD) environment (30). TQM is an abstract concept without a simple, concrete definition. A common theme states TQM is a process of continuous improvement (7:1), (20:22), (43:18). The DOD has adopted the following definition of TQM which emphasizes the need for continuous improvement:

> Total Quality Management (TQM) is both a philosophy and a set of guiding principles that represent the foundation of a continuously improving organization. TQM is the application of quantitative methods and human resources to improve the material and services supplied to an organization, and the degree to which the needs of the customer are met now and in the future. TQM integrates fundamental management techniques, existing improving efforts, and technical tools under a disciplined approach focused on continuous improvement. (7:1)

TQM was adopted by the DOD as a result of the increasing technical complexity of weapon systems and the shrinking defense budget (33:58), (43:17), (45:57). The increasingly technical complexity of modern weapon systems makes the need for quality more important now more than ever

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before. Comparing a World War II (WWII) fighter aircraft to the fighter aircraft used today clearly shows the change in technical complexity of weapon systems. Advances in technology have provided aircraft with countless parts of varying degrees of sophistication. Maintenance of modern aircraft requires many people with a variety of specialties. The WWII vintage aircraft could be maintained by a few well-trained personnel. Modern systems must be of the highest quality to ensure they are available when called upon.

Budget constraints have forced the DOD to find better ways of doing business. In the past, the DOD had high funding levels that allowed for mass inspection of products. The frequency of inspections helped ensure quality requirements were met (16:9-10). They also resulted in "high cost and poor sustainability -- two things we can no longer afford" (16:9). The DOD must now work to build quality in, not inspect quality in. The DOD turned to TQM to improve the system, remedy these problems, and make quality a part of daily business.

The goal of TQM in the DOD is to do exactly what the definition states -- to improve continuously (7:1), (43:18). By continuously improving the process of an organization, the quality of the product or service provided will continuously improve. This continuous improvement will result in quality being built into the product. The increase in quality will result in decreasing both system

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and support costs while increasing system availability and combat effectiveness (44:46).

Another goal of TQM is to satisfy the customer who will receive the product or service that is offered (16:12), (43:19). Former commander of the Air Force Logistics Command, General Alfred Hansen, said ". . . the goal of the AFLC quality program is customer satisfaction in the long haul -- not just initial customer acceptance when we deliver the product" (16:12). Providing a quality product is a sure way to satisfy a customer.

The DOD guide to TQM implementation, DOD Directive 5000.51-G Volume II synopsizes TQM and its objectives in the following way:

> Total Quality Management addresses the quality of management as well as the management of quality. It involves everyone in an organization in a systematic long-term endeavor to develop processes that are customer oriented, flexible and responsive, and constantly improving in quality. *Quality* includes any factor of product or service of value to a customer. Ultimately, TQM is a means through which an organization creates and sustains a culture committed to continuous improvement. (8:1-3)

TQM and its goals are easy to accept, but there is no clear cut, simple path to achieve it. The DOD looked at and adopted many of the same techniques and theories used in private industry to implement TQM. It looked at the TQM methods of experts, including Deming and Juran (7:ii). The various approaches looked at by the DOD to achieve TQM and make it a part of the DOD culture all take different roads

but have the same final destination -- "world class quality" (20:22).

One path to TQM in the DOD receiving a great deal of attention is the Deming management method (1:vi), (7:ii), (16:10), (30), (44:46), (49:58). This method is based on the teachings and philosophy of W. Edwards Deming. The Deming method is the approach to TQM being used by the Department of the Navy (1:vi). It is consistent with all the goals of TQM in the DOD. Thomas Stuelpnagel summarizes the Deming method in the following way:

> Deming's overriding tool is the use of statistical methods. In total, it involves: long range commitment; attention to the customer; hands-on leadership; teamwork; continual improvements in all processes; individual achievement; innovative design; paying attention to the detail; and sharing rewards. All are tied together as a continuous process. (44:47)

Specific Problem

All DOD organizations have been directed to implement TQM, but have not been told how to implement it. The Deming management method is often cited as a path the DOD can follow to make TQM a reality (1:vi), (7:ii), (16:10), (30), (44:46), (45:59). The teachings of Deming are specifically credited with being the basis for the TQM movement in the DOD (30). With all the attention given to the Deming management method, and the belief that it will improve the way the DOD does business, there is little documenting whether it is actually being used and, if so, how it is being used.

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Research Objectives

The purpose of this research was to answer the following questions:

Is there evidence that the Deming management method is being used to achieve TQM in DOD logistic organizations?

If there is evidence that the Deming management method is being used, what techniques are used to implement each of the 14 points?

The answers to these questions will provide information to DOD managers on how to improve their organization by using the Deming management method. Details of techniques that are used in DOD applications will provide managers with an advantage in their quest for TQM.

Scope

This study looked at the implementation of TQM within different DOD components. The vast size of the DOD made it impossible to include the efforts of all organizations. Instead, only organizations with logistics functions were contacted. These organizations were chosen since TQM first began in acquisition areas, and logistics organizations have a major acquisition role. The organizations included were the Air Force Logistics Command (AFLC) depots, the Naval Aviation Depots, the Naval Supply Centers, the Defense Logistics Agency (DLA) Depots and Supply Centers, and the Army Material Command (AMC) Depots. Exceptions were made if the name of an organization that claims to be using the

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Deming management method was found through preliminary research. Additionally, if a directorate within a depot was identified as using the Deming management method they were included.

Justification

There are numerous publications dealing with TQM available through the Defense Technical Information Center and identified in the *Readers Guide to Periodical Literature*, but none deal specifically with how and where the Deming Management Method is being used in DOD logistic organizations.

This study identified users of the Deming management method in DOD logistic organizations, and tells how they are using it. The study lists each of the points of the Deming method and details techniques for implementing them. Managers implementing TQM using the Deming management method or some other path to TQM will be able to use this list as a guide in their efforts.

Definitions

Organization. For the purpose of this study an organization is identified as a depot that is part of a DOD logistics command, or a sperate operating agency within a major command. An example of an organization in this study is Naval Aviation Depot Jacksonville.

Directorate. For the purpose of this study a directorate is a sub-component of an organization. A

directorate is further broken up into smaller components.
For example, OC-ALC/DS is the Directorate of Distribution at
the Oklahoma City Air Logistics Center.

II. Literature Review

<u>Purpose</u>

The purpose of this literature review is to explain the details of the Deming management method. The Deming management method is actually a philosophy that, when adopted and followed by top management, purports to insure an organization to be successful and remain in business in the long run. Dr Deming identifies the need for quality in public sector, and believes quality must be a part of the government. He has the following to say:

> In most governmental service, there is no market to capture. In place of capture of the market, a governmental agency should deliver economically the service prescribed by law or regulation. The aim should be distinction in service. Continual improvement in government service would earn appreciation of the American public and would hold jobs in the service, and help industry to create more jobs. (5:6)

Dr. Deming believes that 85 percent of problems in an organization are management controllable (20:24). This does not mean that management alone can solve these problems, but that management must provide the necessary tools and environment for workers to correct the problems (20:24). Deming's 14 points and Seven Deadly Diseases are directed at management, but to be successful they must be implemented and lived throughout the organization. The emphasis on statistical process control implies a bottom-up approach (20:25).

The philosophy consists largely of 14 points and Seven Deadly Diseases that combine to provide a broad prescription

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for reform (54:34). The 14 points will be listed and explained as they are the focus of this study. A list and brief explanation of the Seven Deadly Diseases will follow.

The 14 points

The 14 points must be adopted by top management and implemented throughout the organization to be successful. The philosophy must be understood, adopted, and lived by all members of the organization to achieve the quality desired.

Point One: Create constancy of purpose for the improvement of product and service (54:55). Management must plan for the future of the organization and develop methods to stay in business (54:56). Plans should be made that reflect the long-term well-being of a firm, not just the next quarterly report. Investments must be made in the organization in areas such as education and research (54:57). These investments ensure the long-term well being of the organization.

An important key to creating a constancy of purpose is to know the customer and what he/she wants and needs (36:9-11). The needs of the customer must be identified and passed on to all members of the organization. Everyone must work to produce a product or service that satisfies the customer and makes them want to come back. The product or service being provided and the process that creates it must be continuously improved.

Point Two: Adopt the new philosophy (54:58). Quality
must become a way of life, not just a "buzz" word.
Following World War II (WWII) the United States dominated
world markets. This was possible because we had a strong
manufacturing base capable of mass production with little,
if any, competition in most markets.

Japan began exporting items to compete with ours, but
initially they were of poor quality. The Japanese worked to
continuously improve quality and have now earned a
reputation as world leaders. While this was happening U.S.
firms continued with their post WWII mindset. Industries in
the U.S. must realize they can not survive unless they
produce affordable, high-quality products and services.

Dr. Deming has the following to say about point two:

> Point two really means in my mind a transformation of
> management. Structures have been put in place in
> management that will have to be dismantled. They have
> not been suitable for two decades. They never were
> right, but in an expanding market you couldn't lose.
> The weaknesses showed up when competition came in. We
> will have to undergo total demolition of American style
> of management, . . .
>   Competition introduced a squeeze. Management
> offered all kinds of excuses. There was every kind of
> thing in this world, except the awful truth that
> Americans were beaten. Where they have been beaten is
> in management. It has been focusing on results.
> (54:59)

Accepting mistakes, defects, poor material, and poorly
trained personnel as things that are inevitable must stop
(5:26). Quality must be expected and demanded. The
organization must change to meet the needs of the customer,
not change just to keep up with the competition (36:23).

Point Three: Cease dependence on mass inspection
(54:61). The practice of trying to inspect quality into a
product after it is built must stop. Quality must be built
in. In the words of Dr. Deming: "Quality comes not from
inspection, but from improvement of the production process."
(5:29). Inspection should be replaced by periodically taking
small samples at critical steps of the process, allowing
early detection of errors. The samples, for a given step,
become the basis for control charts.

The construction of control charts using statistical
methods makes it possible to see what is happening inside a
process. If the process begins to go out of control the
control charts will show this. The problem with the process
can then be corrected and the process brought back into
control. The result is the production of quality parts.

Point Four: End the practice of awarding business on
price tag alone (54:62). The purchase of materials and
services can not be based on price tag alone. The quality
of a product being purchased must be a part of the decision
process. Always buying products on the basis of lowest
price will inevitably result in low quality and high price
(5:32).

The life cycle cost of the item being bought must be
considered. There will be times when it makes sense to pay
extra to purchase an item that will have a longer life. It
may cost more upfront, but it will save money in the end.
The extended life of an item not only saves the cost of

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investment, it also saves the cost of reordering the low
cost item more often. It is important to look at the life
cycle cost of an item to ensure the best decision for the
situation is made.

Entering into long term agreements with suppliers based
on loyalty and trust is important to producing a quality
product. By having a single, reliable, high quality
supplier of an item you can count on the consistent supply
of quality parts. Additionally, a long term relationship
provides security to the supplier. They know they can
invest in the future without fear that they will be underbid
next year (36:131). The result will be ". . . better
quality with better and better economy" (54:65).

Point Five: Improve constantly and forever the system
of production and service (54:66). The process that creates
the product or service must constantly improve, resulting in
a constantly improving product or service. This ties
directly into TQM in the DOD which strives for continuous
improvement. What this point is stating is that improvement
is not a one-time event, it is ongoing (54:66).

An organization that is improving constantly can answer
"yes" to questions such as "is the customer happier now than
last year?" and "are we doing better now than last year?"
(54:67).

Statistical thinking is important to system improvement
(54:67). The process must be monitored and improved to
constantly provide high quality products. Just meeting the

specifications does not mean improvement, it means things
are status quo (54:67). The system must improve to reduce
process variability resulting in less variability in the
product.

Point Six: Institute training and retraining (54:68.
Everybody in the organization must be thoroughly trained in
their job. It is common for a worker to be trained by
another worker who never received proper training. This
results in two workers that are poorly trained.

The worker must know what is acceptable and what is
unacceptable (54:68). The definition of acceptable must be
clear and accepted by all, it can not change in order to
meet a daily quota. Employees must be trained to ensure
they fully understand their job, priorities of the company,
and the needs of customers and suppliers (36:91).

Management must also be trained in company policies.
They must know about the entire operation of the
organization from the receipt of incoming material to the
customer (5:52). If management is not trained they will be
unable to provide the necessary environment for employees to
excel.

Point Seven: Institute leadership (54:70). In the
words of Dr. Deming: "The job of management is not
supervision, but leadership (5:54)." Quite often
organizations employ foremen or supervisors that do not know
how to do the job of the people they oversee. When an
employee encounters a problem or needs additional training

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the supervisor or foreman is unable to help. There is nobody in the role of leader to assist the employee and solve the problem.

The practice of using supervisors and foremen not capable of leading has additional problems. Since they do not know how to do the job they oversee, they often impose numbers or quotas on the employees (54:70). This results in people working to meet quotas, not produce a quality product.

Point Eight: Drive out fear (54:72). Fear in an organization comes in many forms. People do not want to point out a problem for fear they will start an argument or be blamed for causing the problem (54:72). People are afraid to admit they made a mistake so it does not get corrected, it continues on (54:72). People are afraid that suggesting a new idea will make the supervisor angry resulting in some form of retaliation (54:71). A supervisor does not shut down his line for repairs since his daily output will go down. This would benefit the company in the long run but he is afraid he will lose his job because of the poor daily performance (5:60).

These are all examples of fear in an organization. This fear must be driven out to allow people to feel free to ask questions, point out problems and recommend improvements. For any management system to succeed the fear must be replaced with "an atmosphere of mutual respect" (36:75).

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Point Nine: Break down barriers between staff areas (54:74). Breaking down barriers between staff areas encourages the flow of information and teamwork. For example, lets say in a hypothetical organization the engineering department does not communicate with the service department. If the service department is constantly being called to fix a particular part they should inform engineering. This will provide the engineers the opportunity to correct the design, allowing the problem to be avoided on future items. If there is no communication, the product will continue to malfunction in the field. Quality will have to be built in after the fact at a much higher cost then it would have been to build it in. These departments must break down the barriers that are inhibiting the flow of information. Breaking down barriers between staff areas is "a necessary but not sufficient condition of company-wide quality control." (36:79).

Point Ten: Eliminate slogans, exhortations, and targets for the workforce (54:76). Management slogans such as "Zero Defects" and "Do it right the first time" do not motivate employees, they tend to discourage them. These slogans imply that an employ could do better if they tried (54:76). The posters do not account for the fact that the majority of problems are caused by the system, not the workers (5:66). Workers can not improve their product unless they are given quality raw materials and equipment to improve it.

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Point Eleven: Eliminate numerical quotas (54:78). Dr.
Deming maintains that quotas or other work standards "impede
quality perhaps more than any other single working condition
(54:78)." Standards are typically set with an allowance for
scrap built in (54:78). Management is planning on paying
employees to produce scrap.

A work standard is set at an average value. There will
be employees who work faster than the standard and employees
who work slower than the standard. Peer pressure typically
forces the faster worker to slow down so the others do not
look bad. This results in loss to the company and unhappy
workers (54:78).

Other problems arise when piece rate systems are used.
The goal becomes numbers not quality. If a daily quota is
set workers will complete the day's work, then wait for
quitting time.

Setting arbitrary management goals is also a management
problem. Many times goals such as, "improve productivity by
10 percent" or, "reduce rejects by 5 percent" are set. If
there are no changes to the process or no plans for
improvement these become arbitrary goals that can not be
met. Management goals of this type must result from a
thorough plan to improve.

Point Twelve: Remove barriers to pride of workmanship
(54:81). Worker must be given the opportunity and tools to
do a good job and take pride in their work. Management must
ensure workers have adequate training in their job as well

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as the proper tools to do the job. Additional barriers to pride of workmanship include delays and shortages of parts, rush jobs, outdated drawings, and poor working environment -- too hot, too cold, or poor lighting (5:84).

Managers and supervisors must learn how to listen to the workers. The person doing a job is typically the one who knows the best way to do it. Management must listen to the employee's critique of the way things are done. If an employee develops an improved method they should be allowed to freely express their idea, and not fear reprisal. Another barrier to pride of workmanship is the performance appraisal (36:47). The performance appraisal seeks to evaluate all employees by ranking them against each other. Many organizations base bonuses and raises on the performance appraisal. The appraisals result in destruction of teamwork, mediocrity of work, increased variability, and a short term focus (36:48)

Point Thirteen: Institute a vigorous program of education and retraining (54:84). The people in an organization must be constantly learning. They must learn about new equipment, new materials, and new techniques that are part of their job. Investing in people through education and training is required for long-term planning and the long-term well being of the organization (54:84).

Employees must be educated in statistical techniques including control charts, flow diagrams, cause and effect diagrams, histograms, pareto charts, and scatter diagrams

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(36:98).   This constant and ongoing training will not only

make employees better at their existing jobs but prepare

them for future jobs as the organization changes.

Training must be provided to the entire organization in

group dynamics to aid them in working together on teams.

The organization must pull together to work towards quality

and continuous improvement.   This requires the use of

teamwork.   Training the employees in group dynamics will

improve the teams chances achieving their objectives.

Point Fourteen: Take action to accomplish the

transformation (54:86).   Management and personnel throughout

the organization must begin to implement the other 13

points.   Training must take place, everyone must learn how

to improve continuously.   This process must begin with

management as a sign of their commitment (54:86).

Everyone in the organization must ask themselves who is

the customer.   They must also know what the customer wants.

Customers both internal and external to the organization

must be identified (54:87).

A good place to begin is the Shewhart Cycle -- often

called the PDCA Cycle for Plan, Do, Check , Act (54:86).

This cycle consist of 4 steps that will lead to continuous

improvement.

> Step 1:   The first step is to study a process, to
> decide what change might improve it.   Organize the
> appropriate team.   Perhaps people from purchasing, or
> the supplier, or the product engineer.   What data are
> necessary?   Does the data already exist, or is it
> necessary to carry out a change and observe it?   Are

tests necessary? Do not proceed without a plan.
(54:86)

Step 2: Carry out the tests, or make a change,
preferably on a small scale. (54:86)

Step 3: Observe the effects. (54:87)

Step 4: What did we learn? repeat the test if
necessary, perhaps in a different environment. Look
for side effects.   (54:87)

The use of this cycle "will lead to continual improvement of
methods and procedures (54:88)." It can be applied to any
process.

An additional step that can aid in accomplishing the
transformation is the appointment of a statistician to work
directly with top management (36:137). These statisticians
must be trained in, and understand, Deming's philosophy.
The statistician must be able to sit in and contribute to
operating review meetings (36:137). They must be able to
speak freely and openly with top management to "identify
inhibiting management systems, and coordinate action on
opportunities for improvement" (36:137).

The Seven Deadly Diseases

The Seven Deadly Diseases are items that must be
avoided to ensure the long term success of an organization.
They are a complement to the 14 points already discussed.
The Seven Deadly Diseases are straight-forward and easily
understood. They are clearly defined by Mary Walton as
follows:

1. *Lack of constancy of purpose*. A company that is
without constancy of purpose has no long-range plans

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for staying in business. Management is insecure, and so are employees.

2. *Emphasis on short-term profits.* Looking to increase the quarterly dividend undermines quality and productivity.

3. *Evaluation by performance, merit rating, or annual review of performance.* The effects of these are devastating -- teamwork is destroyed, rivalry is nurtured. Performance ratings build fear, and leave people bitter, despondent, and beaten. They also encourage the mobility of management.

4. *Mobility of management.* Job-hopping managers never understand the companies they work for and are never there long enough to follow through on long-term changes that are necessary for quality and productivity.

5. *Running a company on visible figures alone.* The most important figures are unknown and unknowable -- the multiplier effect of a happy customer, for example.

6. *Excessive medical cost.*

7. *Excessive cost of warranty, fueled by lawyers that work on contingency fee.* (54:36)

Summary

This literature review looked at the Deming management method. The Deming management method is based on continuously monitoring the process that produces the product or service provided using statistical process control, and continuously improving that process. The Deming management method also places emphasis on identifying the wants and needs of the customer, and working to meet those wants and needs. Finally, the Deming management method focuses on treating employees with respect and giving

them the tools and training necessary to continuously improve themselves and their processes.

Each of the 14 points was briefly explained to provide an understanding of the change required by organizations using the Deming method to implement TQM. The seven deadly diseases were also identified because they reenforce the 14 points.

III. Methodology

To answer the research questions a two step approach
was used. Step one identified organizations that are using
the Deming method to implement TQM.   Step two was to
determine how each of Deming's 14 points are being
implemented.

Step One

Step one answered the question: "Is there evidence
that the Deming management method is being used in the DOD?"
The first call was made to the office responsible for the
implementation of TQM in the DOD, the Office of the
Assistant Secretary of Defense (Production & Logistics)
Total Quality Management/Industrial Productivity and Quality
[OASD(P&L)TQM/IPQ]. OASD(P&L)TQM/IPQ was asked for the TQM
points of contact for the Army, Navy, Air Force, and Defense
Logistics Agency. Contacts were called; they were asked to
provide points of contact for TQM for their separate
operating agencies in the continental United States.

Each of the separate operating agencies was then
contacted. They were asked to provide their TQM points of
contact for each of their logistical organizations. Each
logistics organization TQM point of contact was then
contacted and asked what philosophy, if any, they are
following to implement TQM. The organizations that
indicated they were using the Deming management method were
then asked to provide details on their TQM implementation.

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Copies of their implementation plan, timelines, guidelines, steps taken to date and steps planned were requested. Additionally, documentation showing benefits they have experienced that can be attributed to TQM were requested.

Step Two

Step two was to organize and present the information received, then categorize it according to the 14 points. All the steps and techniques being used were put into the appropriate point. The benefits attributed to the implementation of the Deming management method were also documented.

This step also included return phone calls to organizations to obtain additional information and clarification on how they are implementing Demings' 14 points.

Additionally, during this step, three organizations were chosen to answer the questionnaire included in Appendix A. The purpose of the questions was to gain further insight into what is being done to implement the 14 points. The questionnaire was sent to one organization with a maintenance mission, one with a supply mission, and one with an intelligence mission. The reason for choosing such diverse organizations was to gain a broader perspective of the Deming management method at work.

Limitations

This research was affected by the size of the DOD. It
is not practicable to contact each individual organization
in the DOD to determine what they are doing to implement
TQM. In the early stages of research an attempt was made to
contact each directorate in each organization. This quickly
proved to be too large a task to undertake. It would have
increased the number of calls by a factor of ten or possibly
more.

The research was further limited by the length of time
available in an academic year to complete the study. To
fully understand what impact TQM efforts are having on an
organization you must talk to the employees and obtain their
insight. You must also be able to talk to the customer the
organization serves to obtain their perceptions on the
improvements TQM has had on the product or service being
received. With the given time constraints of completing
this study, it was not possible to interview additional
people.

This approach to answering the investigative questions
requires a large number of phone calls. It was difficult to
contact the proper personnel and have adequate time to
thoroughly discuss their methods. The ability of the
personnel contacted to spend extensive time on the phone
discussing their efforts also affected the outcome.

The extent of written documentation available on the
TQM programs of the various organizations affected the

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outcome. Some organizations have extensively reviewed and documented what they are doing. Others have vary limited written documentation available. Since a great deal of information was extracted from the written documentation obtained, the lack of documentation from some organizations affected the results.

The research was also affected by the inability to validate the methods organizations claim to be using. It was not possible to travel to each individual location and actually see the technique or its results in action. Furthermore, it was not possible to validate all information provided to ju fy an organizations' claim of success resulting from TQM due to the size of the DOD and the time factors.

IV. Findings and Discussion

Introduction

A total of 69 organizations were contacted by telephone
during the research process and asked the questions
discussed in chapter 2, that is, is the Deming management
method being used to implement TQM and, if so, how. These
consisted of 20 Air Force organizations, 15 Army
organizations, 15 Navy organizations, and 13 Defense
Logistics Agency (DLA) organizations. The remaining 7
contacts were Pentagon TQM points of contact for the
agencies and other DOD quality institutes. A complete list
of all organizations contacted during the research is
included in Appendix B.

The most common approach to implementing TQM discovered
was the hybrid approach. The hybrid approach is studying
the teachings of experts in the fields of quality and
quality management and developing an implementation approach
tailored to the organization. All organizations using this
approach stated the philosophy and teachings of Dr Deming
were included in the development of their hybrid. Deming
influenced and played some part in their planning process.

The Aeronautical Systems Division (ASD), a Division of
the Air Force Systems Command (AFSC), is an example of an
organization using the hybrid approach. They reviewed the
teachings of Deming, Juran, and Crosby. Then, with the
assistance of an outside contractor, a TQM vision, strategy,

and implementation plan were developed. Their plan includes ideas borrowed from Deming, but does not attempt to follow all of Deming's teachings (19).

The Defense Electronics Supply Center (DESC), a part of DLA, also used the hybrid approach. DESC looked to the teaching of Juran for their TQM structure, organization, and implementation approach. They follow Deming's teachings on "softer" issues, such as attitude and behavioral changes and emphasizing the needs of employees (37).

Sierra Army Depot (SAAD), of the Army Material Command (AMC), as another example of the hybrid approach. They built their program on the teachings of Deming, Juran, Crosby and Ishikawa. They take a "whatever works" approach to TQM (3).

One of the common reasons cited for using the hybrid approach is that no one expert advocates an approach that satisfies all requirements of a DOD organization. The most common problems identified with Deming's teachings are the desire to move to single source suppliers and the desire to do away with performance appraisals (56), (52), (15).

Esther Griguhn stated Tooele Army Depot does not want to advocate the use of Deming's philosophy since they can not accomplish the items stated above. Single sources of supply and the abolishment of performance appraisals are not allowed under current DOD regulations. Tooele believes these are good goals to have, but since accomplishing them

is so far off in the future it would be more detrimental to advocate them than to leave them out of their goals (15).

The hybrid approach was clearly the most common approach chosen to implement TQM. The only other approach identified that is being taken to implement TQM is the Deming management method, that is, trying to follow the teaching and philosophy of Dr Deming. Many of the ideas advocated by Dr Deming are also advocated by other gurus such as Juran and Crosby, but none of the organizations contacted claim to be disciples of them. Dr Deming clearly is the primary force behind TQM in the logistics organizations contacted.

Deming Users

There were 21 organizations contacted that claim to be basing their TQM implementation on the teachings of Dr Deming, that is, they are trying to live the 14 points and use the Deming management method. Each Deming user is identified below (a short list is included in Appendix C). Their implementation is discussed to varying level of detail.

The amount of detail is a function of the amount of hard copy information made available. Some organizations have extensive documentation on their programs, others have vary little. A telephone interview was held with each organization, but it was not intended to obtain specific details of their program. Available documents were

requested to allow thorough review and out of respect for the time of the participants.

Air Force.

SM-ALC/TID. The Directorate of Distribution at Sacramento Air Logistics Center (SM-ALC/DS) began a demonstration project on 18 Feb 1988 entitled Pacer Share (6:12079). Since the beginning of the project SM-ALC reorganized, and SM-ALC/DS is now SM-ALC/TID (TID). The purpose of Pacer Share is to demonstrate the productivity of a Federal Organization can be improved with the adaptation of new management methods. SM-ALC/TID is following the Deming management method as part of their project.

14 Points. One of the first steps taken by TID was to put Dr Deming's 14 points into their own words. To modify them and tailor them to their organization (28). TIDs versions of the 14 points follow.

> 1. Create and maintain constancy of purpose. All members of DS, at all levels must commit themselves to increasing productivity through higher quality of both goods and services, improved relations with all members of DS and their representative organizations, and reduced costs of operations in order to improve our ability to provide customer service. (28)
>
> 2. We fully subscribe to and adopt the new philosophy that embraces economic stability and improved performance and refuses to allow commonly accepted levels of delays, mistakes, defective materials and defective workmanship. Labor and management must accept the role of leadership in this effort both internally and with external suppliers. (28)
>
> 3. We will cease dependence on mass inspection as a way to achieve quality. We will require, instead, statistical evidence of built-in quality. (28)

4.   We will work to end the process of awarding contracts and business on the basis of price tag. Assuring that quality is a necessary consideration. (28)

5.   All members of DS will dedicate themselves to look for problems. We shall constantly improve every process and system in Distribution, and work to increase quality and productivity, reduce variation, and thus reduce costs. (28)

6.   Distribution shall institute and maintain a strong training program for all members. (28)

7.   We shall develop supervisors to become more capable of helping people, improving methods, materials, machines, systems, and processes so as to help all members and the organization, to do a better job. (28)

8.   Distribution management shall create an atmosphere where all members are encouraged to talk openly about their jobs, make suggestions, question procedure, and participate in the improvement process without being concerned that their careers or jobs are endangered or that they will lose favor with supervision and management. Opportunities for such participation must exist both in the normal day to day interfaces and staff meetings between managers, between managers and non managers and in the special, participative forums of the DS quality circles, task forces, and process action teams.   (28)

9.   Management will dedicate itself to removing barriers between divisions, branches, and all DS organizations, at any level. All members will work together to become a single team so as to foresee and prevent problems that may be encountered in doing and improving the way we do our mission. (28)

10.   Distribution will eliminate numerical slogans and targets asking for increased productivity unless the methods to attain that increase are also provided. Methods should include guidance related to process analysis and quality. (28)

11.   Distribution will eliminate numerical quotas or quantity measurements, unless the essential quality and process/system guidance required is also provided. (28)

12.   The Directorate dedicates itself to removing any and all barriers that inhibit all members' the right to pride of workmanship. This will be accomplished

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through the establishment of quality as the critical internal measure, and the prevention of the entry of poor quality input into DS. (28)

13. Distribution will institute and continue to support both a vigorous internal program of education and the self improvement of all its members through off-the-job education and development efforts. (28)

14. Distribution management will work everywhere and always to effect the change called for by these principles of management. (28)

Goals. TID is making a long term commitment to this philosophy and their 14 points. This can be seen by looking at the goals contained in their five year plan. The goals and 14 points are related. Of the 14 points, all but point 1, which is reflected in the Directorate Statement, is reflected in at least one of the goals listed below.

Goal #1 - Implement project interventions. Goal #1 intends to implement the specific Demonstration Project interventions as outlined in the Federal Register, 20 Nov 1987. The five interventions are:

   a. Productivity Gainsharing
   b. Series Consolidation and Pay Banding
   c. Supervisory Grading Criteria
   d. Demonstration on Call
   e. Elimination of Individual Employee Appraisals
   (39:2-3)

Reflects Points 2, 3, 5, 6, 7, 8, 9, 10, 11, and 12.

Goal #2 - Develop a participative management style. (39:44)

Reflects Points 2, 5, 7, 8, 9, and 12.

Goal #3 - Establish a DS training program. (39:49)

Reflects points 6, 7 and 13.

Goal #4 - Promote the Directorate of Distribution. Goal #4 relates to the public and personal image held of Civil Service employees. (39:57)

Reflects point 12.

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Goal #5 - Managed proposed project changes. Goal #5 addresses how we will manage proposed changes to the Pacer Share demonstration plan as published in the Federal Register. (39:64)

Reflects points 5 and 14.

Goal #6 - Determine project disposition recommendations. (39:69)

Reflects points 12 and 14.

Goal #7 - Assist other agencies with implementation. (39:86)

Reflects point 14.

Goal #8 - Establish a research and design organization. (39:90)

Reflects points 4 and 14.

Training. A key part of TIDs program is extensive training. There are both required and optional courses available for individuals. The classes available in TID follow.

Teambuilding. The purpose of this training is to assist the workforce in achieving continuous process improvement by creating and sustaining a partnership among leaders and followers, both between interdependent teams and within teams themselves. This training helps improve communication and relationships, providing a better working relationship. (28)

Data Collection. This class instructs attendees in data collection methods, and helps ensure accurate data. (28)

Statistical Process Control (SPC). This class teaches basic statistical concepts to aid in process analysis. Students must complete the data collection class prior to attending this class. Actual data they have collected is then used for this class. (28)

Essential Structured Analysis (ESA). This class is mandatory for all supervisors and team leaders. It provides a structured way of looking at all that is involved in a job. The functions and flow of information through a work unit are flow charted. Methods of

identifying internal and external customers and their wants and needs are discussed. Also, ways to determine quantifiable measurements of evaluating the customers needs are taught. (28)

Ethics for Supervisors. This class is designed to instruct supervisors in the ethics involved of dealing with employees to ensure all are treated fairly. (28)

Effective Briefing. This is an optional class that meets once a month to help people learn effective briefing. (28)

Leadership/Followership. This class is designed to help people be not only good leaders, but also good followers to ensure the proper working of groups. (28)

Communication. TID is not relying on training alone. They have taken steps to ensure their employees and customers have avenues of communication. To spread information to the workforce the *Pacer Share Update* is published and distributed to the workforce bi-weekly. This includes a variety of information for the employees. Included is the type of training available and when it is offered; information on personnel awards, transfers, retirements, and promotions; notes from the commander; savings and results from TQM efforts; and general information on topics of interest.

Employees are encouraged to openly communicate with their supervisors and managers. Additionally, the Good Ideas for the Taking (GIFT) program is in place. This is a suggestion program for the employees. Ideas are submitted to both the first line supervisor and the TQM Program Office. Responses must be made in 10 working days.

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Approval is at the lowest level possible. Disapproval must come from the Division level.

An Interface Division was established in October 89 to improve customer support. They aid in identifying customer wants and needs and answer any inquiries.

Job Proficiency Guides. Job Proficiency Guides (JPGs) have been issued to each individual in TID. A JPG list all the jobs and skills an employee can perform. It follows that person throughout all job assignments. The unique part of the JPG is it requires both employee and supervisor sign off that task can be completed. This is a way of ensuring the person is capable of completing all task they are responsible for. In the past an employee would attend training and then be responsible for the job. Now they must demonstrate their ability to complete the job to the supervisor before they are certified as being capable of doing the work (40:3).

Gainsharing. Productivity improvements are rewarded by Gainsharing. an innovation introduced under Pacer Share. Employee cost (wages) are 90 - 95 percent of total controllable cost in the Directorate of Distribution. TID monitors these cost. Reducing wages while performing the same or increased workload results in a gainshare, that is a cost savings. The savings are then equally split between employees and AFLC. The use of the employee cost as the measure is to ensure that additional people are not

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added to increase throughput at increased cost. The goal is to improve the process (6:12078).

Results. The move to the Deming management method has been credited with improvements. In the packaging function employees asked why some items required extra packing material. A review of the regulations indicated that those items only required extra packing material when being sent under a small range of priority codes. By correcting the procedures, and only packing those items that needed extra packing with extra packing material, material cost were lowered and 23 labor hours a week were saved. In the Research and Cataloging Unit the backlog of request for processing parts was reduced from 65 days to 7 days in less than one year. This was done through essential structured analysis (ESA), defined above. By identifying the customer and learning their needs they were better able to organize themselves and work to fill the customer requirements.

Surveys. TID measures itself with internal surveys. In Jun 89 a Leadership Effectiveness Survey was conducted. An outside contractor conducted the survey to assess employees' opinions of their supervisors and management. The results were then given individually to the supervisors, they were not made public. The purpose of this was to allow supervisors to learn about their strengths and weaknesses in a non-threatening environment. The secrecy allowed employees to freely and openly give their opinions.

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Another survey was conducted of the teams developed in a work area. The survey was used to identify what techniques they were using to attack and solve their problems. The results are used to identify strengths and weaknesses in training and be able to make good decisions on where to allocate scarce funds.

Additional surveys are used as stated above in the ESA training. All supervisors conduct surveys to identify customers wants and needs to allow them to better serve the customer.

As part of Pacer Share an annual survey is conducted by the Rand Corporation to evaluate the progress of the program. SM is compared with the Distribution Directorate's at the four other AFLC depots. The second year survey indicates favorable results. Compared to the other depots, SM has improved working conditions as it relates to meaningfulness of the job, increased trust in management, increased training opportunities, and increased satisfaction with supervisors. Additionally, the turnover rate has decreased. The one area that did not improve was the area of pay satisfaction. Compared to the other depots the pay at SM increased; however, the higher cost of living in the Sacramento area may have affected their perception of the spending power of the money (32:2-4).

Foreign Technology Division (FTD). The Foreign Technology Division (FTD) of the Air Force Systems Command (AFSC) is not a logistics organization as are the others in

this study. FTD is an organization that provides information on foreign technology to the DOD. The purpose of FTD is: "To provide our customers with information and data about foreign aerospace systems subsystems, and technologies which have military potential (11:2)." FTD is committed to the Deming management method, therefore included in this study.

FTD formally began TQM in November 1989 with a letter from the commander to all personnel stating their commitment to TQM and continuous improvement. Since their beginning, FTD has taken many steps on the path to change. They established a TQM executive steering committee (ESC) comprised of the senior management in the command section and the deputates. All members of the ESC were sent to the Deming seminar. Their first job was the development and dissemination of their philosophy and guiding principles.

Guiding principles. FTD's guiding principles place a heavy emphasis on people, both the customer and the employees. They also emphasize quality and continuous improvement. The following excerpts from their Statement of Purpose, Fundamental Values, and Guiding Principles exemplify their commitment.

Customer - Our customers depend on us. We play a critical role in their ability to satisfy their missions. FTD exists only to meet their needs. (11:2)

Culture - Our work life is a vital source of personal satisfaction and growth. How we go about accomplishing our mission is fundamental to our long-term effectiveness. (11:2)

Quality comes first - Our products and services are one of
a kind; they must be as accurate, as timely, and as easily
comprehended as we can make them. (11:2)

Support to our customers is the focus of everything we
do - we must know our customers well. Our products and
services must satisfy their needs. (11:2)

Continuous improvement is essential - we cannot satisfy
the expanding and evolving needs of our customers without
continuous improvement. (11:2)

Training. All employees receive a 20 hour
TQM Awareness Training course. This course explains the
mission and purpose of FTD. It also explains the objectives
of TQM at FTD which are:

Make FTD a better and more fun place to work.

Improve FTD's productivity to satisfy more customer needs.

Implement DOD and AFSC TQM directives. (11:4)
This course then provides an overview of Deming's
philosophy, and explains each of the 14 points. Finally,
basic problem solving tools are presented including flow
charts, brainstorming, cause and effect diagrams, and pareto
charts (11:ii).

FTD is also providing teambuilding, statistics, and
facilitator training. As of April 1991 ten percent of the
employees received teambuilding training, and 3 percent had
received training in statistics. The facilitator training
was just beginning, and numbers were not yet available.

Teams. There are three types of teams
employed to solve problems that are identified. Quality &
productivity improvement teams (QPI teams) work on broad and
complex FTD wide problems. Process improvement teams (PI

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teams) work on deputate wide problems. Finally, process actions teams (PATs) are work group teams trying to improve their own processes (11:37-39). Different names were given to the teams to signify the level of the problem being worked (50).

Surveys. In an effort to identify problem areas within FTD a survey of all employees was conducted. The survey provided the people a chance to identify the strengths and weaknesses of the organization. It also pointed out areas that need management attention to make FTD a better place to work. Finally, it serves as a baseline for measuring changes (50).

The employee survey resulted in the development of a QPI team to look at clerical training. The QPI team found there is little structure to the training requirements of the clerical staff. This is unacceptable as they are depended on to provide a large number of services, and must be capable of performing without someone looking over their shoulder. The jobs of the clerical staff and available training are now being studied. When complete, a standard training plan will be put into place to ensure the clerical workers receive the correct training to perform their job. It is the goal of FTD to do this for all job series in their organization (50).

In an effort to satisfy their customers FTD has gone out and surveyed them. FTD asked for the customers expectations and needs. FTD has taken the customer's

timeliness requirements and is using SPC to track their deliveries and ability to meet the time schedules (50).

Other steps. An additional step taken by one deputate to aid in training is the development of an expert system that helps identify "experts". FTD works with very complex and technical information. Quite often a person will come across data that is unclear or possesses some type of problem. The expert system is designed to help solve the problem or find someone that can help. It is designed to allow for freer sharing of information (50).

A step taken by FTD to allow for free and open sharing of information and ideas is the addition of a TQMNET to their local area computer network. A large variety of information is available for employees who log in. There are updates about TQM efforts, notes from the commander, and articles on TQM. There are also comments on each of the 14 points provided by the FTD "champion" of the point, a person responsible for learning about the point, explaining it, and helping to answer questions pertaining to it.

The TQMNET also contains an option to allow for questions and answers and suggestions. The reply is sent out over the network for all to see. When action is required, updates are provided. This is the most used feature of the network. Bulletin boards are posted to present the same information to those employees who do not have access to the TQMNET (50).

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Navy. The Department of the Navy (DON) has made a commitment to TQM at all levels. The Deming philosophy is a major factor in their TQM efforts. H. Lawerence Garrett, III, the Secretary of the Navy, states: "TQM is largely based on the principles and longstanding work of W. Edwards Deming. . ." He goes on to say: "While there are other approaches to quality improvement, Deming's emphasizes leadership responsibilities and integrates process improvement methods with new methods for leading people (12:4)."

Although the top levels of the Navy advocate the Deming management method, they are not forcing it on all Navy organizations. Many Navy organizations have been involved in quality improvement programs for many years, and they are not expected to change what they are doing. Also, if an organization does not believe the Deming management method is appropriate for their work environment they are allowed to choose another approach that will lead them to continuous improvement (57).

The Navy has benefitted greatly from the work of the Navy Personnel Research and Development Center (NPRDC). NPRDC has done extensive research in TQM, particularly in the Deming management method. They have developed and published a recommended course for process improvement. The book, *A Total Quality Management Process Improvement Model* (27), suggest a recommend organizational structure and methods for following the plan-do-check-act cycle.

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The structure recommended by NPRDC includes an executive steering committee, quality management boards, and process action teams. This structure has been adopted and is in place in numerous Navy and Army organizations. This can be seen in the summaries provided in this study.

HQ NAVAIR. In 1986 the Naval Air Systems Command (NAVAIR) adopted what is now known as total quality management in an effort to assure continuous improvement in the command. Each depot developed a Corporate Business Plan that addresses their long term strategies (24:ii). The commitment of HQ NAVAIR to TQM is seen in their mission statement, which includes: "Our commitment to total quality management will make our customers brag about us and demand our services above all others (24:1)."

HQ NAVAIR is following the Deming management method and recommends this approach to all organizations within it. Although they recommend Deming, it is not a requirement. Organizations within NAVAIR are free to choose the approach to implementing TQM they believe is best for their work environment (60).

Not surprisingly, five of the six NAVAIR depots claim to be following the Deming management method. NADEP North Island claims to be using a hybrid approach. The roots of their program are based in Deming, but they do not claim to be limiting themselves to Deming at this time (29). (Additional information about NAVAIRs TQM program and its

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beginnings can be found in Mary Walton's book *Deming Management at Work*.)

NADEP Alameda. Naval Aviation Depot Alameda began its TQM implementation in 1985. They place particular emphasis on Statistical Process Control (SPC), and have a statistician on staff to assist in this area (55:34). SPC, particularly the use of control charts, is used to monitor many processes including the cost of work performed and cycle time. They use the control charts to determine when there is a change in the process that requires management attention (17). They provide training in the following areas: Introduction to TQM Principles, SPC, SPC using LOTUS 1-2-3, Effective TQM Meetings, TQM for Supervisors, and an Engineer-Oriented SPC-Taguchi Concepts Overview. All presentations are designed for four hours or less in an effort to provide just-in-time training (55:34).

NADEP Jacksonville. Naval Aviation Depot Jacksonville (NADEP Jax) began implementing TQM in 1987. They are following the Deming management method in their program. NADEP Jax has a Strategic Business Plan (SBP), updated annually, that shows their commitment to TQM. The SBP identifies two Key Accomplishments they are striving to achieve. These are:

> Key Accomplishment I: We will improve quality of worklife for all Naval Aviation Depot, Jacksonville employees and will become known as the employer of choice.

> Key Accomplishment II: We will continuously improve quality, cost, and schedule performance. (26:1-5)

To make Key Accomplishment I a reality NADEP Jax plans on analyzing each job and determining what skills are required to perform the job. Once identified they will determine what skill the employees doing the job possess, then provide training as required. Additionally, by providing training in communication they hope to improve employee/supervisor communication/feedback (26:1).

To make Key Accomplishment II a reality NADEP Jax is turning to TQM. They believe that by providing the proper structure to allow communication and improvement and providing the necessary training they can make continuous improvement and quality a part of normal operations. A series of independently conducted employee surveys are scheduled for late 1991 to assess there progress in this area. They will try determine the level of understanding of TQM by managers and supervisors and determine the TQM awareness of employees (26:4-6)

Structure. NADEP Jax has adopted a structure designed to implement TQM and make continuous improvement and ongoing process. They are using an Executive Steering Committee (ESC), a Strategic Quality Management Board (SQMB), Quality Management Boards (QMBs), and Process Action Teams (PATs).

The ESC provides focus, establishes policy, and provides resources. Their responsibilities include setting policy for the overall TQM improvement effort, establishing and disseminating the strategic goals, developing and

maintaining a good relationship with customers and suppliers, reviewing the SQMB, evaluation and prioritization of recommended changes, and overseeing education and training (23:15).

The SQMB is responsible for developing the strategy for improvement and setting priorities. They must establish QMBs and PATs, and provide a member for each QMB established. They are also responsible for reviewing the QMBs and PATs and providing recommended changes to the ESC (23:15).

QMBs are chartered for quality improvement within the strategy and goals established by the SQMB. Their members are permanent. They are responsible for establishing PATs and providing one member for each PAT established. Additionally, they analyze data, plot processes, and analyze causes. They provide recommended changes to the SQMB (23:15).

PATs are established by QMBs to address a specific problem or issue. They must document the process and collect and analyze the appropriate data. They provide recommendations for improvement to the QMB (23:15).

Training. All NADEP Jax senior management attends a four day Deming Seminar to learn about the Deming management method and gain insight into the 14 points (42).

All personnel receive a TQM indoctrination that discusses the Deming management method and provides a general overview of TQM. Different techniques commonly used

in TQM such as flow charting and pareto charts are also discussed (42).

All employees attend an Interpersonal Problem Solving (IPS) class. This class teaches how groups interact and how to work together to solve problems (42).

Statistical Process Control (SPC) is also taught. This is intended to teach employees the basics in SPC. Personnel are available to help solve complex problems that may arise. A full time statistician is on staff (42).

Other steps. In addition to providing a structure and training to encourage continuous improvement, NADEP Jax has conducted a series of surveys to identify their strengths and weaknesses. They have surveyed both their customers and employees to determine their needs and expectations. The results of these surveys identify areas requiring management attention for improvement (42).

A library of books, videos, and articles dealing with TQM, leadership, and continuous improvement has been established. This is available to all employees as an easily accessible source of information (42).

An artisan certification program has been established to replace the quality assurance function and mass inspection. The artisans in the shops provide their own inspection function. They are now trying to build quality in, not inspect quality in. This puts the responsibility for quality on the shop performing the work, not the quality assurance (QA) function responsible for inspecting the work.

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In cases where catastrophic failure could occur due to lack of quality a second artisan performs an inspection, QA is still not involved. QA now serves as a facilitator in process improvement. They are no longer a watchdog looking for problems (42).

Results. The efforts put into TQM are providing results. Two success stories follow.

The high performance paint team (HPPT) evaluated the paint and repair process of the P-3 and T-2 aircraft. They flow charted and analyzed the process, allowing them to identify problem areas that could be corrected. They improved the flow of the process and eliminated unnecessary steps. Additionally, they determined the painting equipment needed repair, the paint changed resulting in application problems -- instructions had not been updated for the new paint, and inadequate lighting. The benefits included a 70% reduction in quality defects, an eight day reduction in turnaround time on the P-3 and a 6 day reduction in turnaround time on the T-2, elimination of one aircraft move, and a 600 manhour reduction on the P-3. This all leads to a savings of approximately $20,000 per aircraft (42).

The hazardous materials team was able to identify and correct many problems in the calibration lab. The team inspected their work area and identified all chemicals on hand as well as practices used to handle the chemicals. Some chemicals had to be sent to a lab for identification

due to lack of labeling. After determining that there was no adequate program in place to deal with hazardous chemicals the team set out to correct things. All chemicals have now been inventoried and are now properly identified and stored. There were 30 chemicals on-hand that are no longer used. They have been properly disposed of. All carcinogens have been removed from the lab. Additionally, all employees now receive training in the use and handling of hazardous chemicals. This team did not result in financial savings, it produced a result that improves the quality of the work area and provides a safer work environment. The work is an example of continuous improvement in a not so traditional manner (42).

NADEP Cherry Point. Naval Aviation Depot Cherry Point is committed to quality management and believes it is a critical element in the continued success of their organization. There are several fundamental elements that constitute their program, they include:

Long range planning coupled to cultural change

Employee involvement -- participation in problem solving

Customer involvement -- continuous feedback for problem identification and correction

Measurement -- use of statistical methods for assessing improvement in process

Training -- skills enhancement and specialized quality improvement training

Employee rewards and recognition -- a productivity gainsharing program. (25:1-2)

These elements are further reflected in their mission

statement, which states:

> To provide our nation with the highest quality, worldwide
> aviation depot level maintenance, engineering and other
> logistics support on time and at the least cost.
>
> Measures of our success are:
>
> Customers demand Cherry Point products and services above
> others.
>
> We provide products and services at lower costs through
> enhanced vendor relations and continuous process
> improvement.
>
> Employees come to work with a sense of anticipation and
> relish, and leave with a sense of accomplishment and
> pride.   (25:3)

Cherry Point knows that words alone will not result in the

quality they are looking for, they must provide a quality

structure and training.

<u>Structure</u>.   Cherry Point has developed a

structure to make quality a part of their business. At the

top of the structure is the Executive Steering Committee

(ESC).   The ESC is a: "Committee composed of top management

representatives which set the policies to be followed, and

set the policy in implementing TQM. It provides the

ultimate level of support for QMBs and PATs (25:9)."

Underneath the ESC is the Department Head Quality Management

Board (DHQMB).   The DHQMB is "composed of all department

heads which are tasked with TQM implementation (25:9)."

Below the DHQMB are Quality Management Boards (QMBs).

QMBs are:

> Boards comprised of members from relevant areas, i.e.,
> department, division, etc. They provide the

organizational structure that eliminates friction between
various organizational units, and enable the use of group
problem solving techniques. QMBs are permanent groups;
they do not dissolve after problems are solved, but
oversee continual process improvement. (25:10)

The QMBs can be thought of as a "pyramid of interlocking

loops" (4). A manager that is chairman of one QMB will be a

member of other QMBs. The result is a network of managers

working together to solve organizational problems (4).

After the QMBs are the process action teams (PATs). A

PAT is: ". . . comprised of individuals which work on a

specific issue, problem, or process. The teams are

specifically formed to address a particular concern, and

dissolve on completion of their work (25:10)." The final

groups formed are the Shop/Office TQM Teams. These teams

review suggestions submitted by employees from their own

shop to study a process for possible improvement.

A Key Implementation Team (KIT) is used to tie and hold

all these teams together. The KIT is a: "Group of people

which facilitates TQM implementation. It performs the

following functions: process control coordination, training

development, organizational development,

documentation/measurement, and Facilitator coordination

(25:9-10)."

The Facilitators are "in-house personnel selected and

trained to serve as trainers and consultants to the various

QMBs and PATs (25:10)." There are 80 personnel that

function as facilitators in addition to performing their

other duties. Facilitators act objectively in working with

the teams. They help to resolve any conflicts that may

arise, and provide necessary training just-in-time (25:20).

The final link in the TQM structure is the TQM

Coordinator. The TQM coordinator is a person who:

> . . . monitors, plans, collects information about
> progress, assists with administrative arrangements and
> whatever else to ensure implementation activities
> continue. This individual is responsible for
> implementation of policies and operational administration
> initiatives pertaining to the overall TQM effort including
> directing KIT efforts. The duties of this person become
> more crucial, as implementation expands to the entire
> organization. (25:10)

Training. To support this TQM structure

Cherry Point is committed to training the workforce. More

than 200 managers have attended the four day Deming seminar

on productivity and quality (24:7). Additionally, an

extensive list of training courses have been developed and

are given to the workforce. The following courses are now

available and provided at Cherry Point:

> A. *TQM Familiarization for Managers and Supervisors*.
> This course is intended to familiarize participants with
> the management theories of Dr W Edwards Deming, and to
> provide background information on Total Quality
> Management. The course also provides a basic awareness of
> the major concepts of Statistical Process Control, and
> explains why TQM puts so much emphasis on the reduction of
> variation. (4 hours) (25:Annex)

> B. *TQM Familiarization for All Hands*. This course is
> intended to familiarize participants with the management
> theories of Dr W Edwards Deming, and to provide background
> information on Total Quality Management. The course also
> provides a basic awareness of the major concepts of
> Statistical Process Control, and explains why TQM puts so
> much emphasis on the reduction of variation. (2 1/2
> hours) (25:Annex)

> C. *Methods for Management of Quality and Productivity
> (The Deming Seminar)*. The purpose of this seminar is to
> inform management of what they must do to improve the

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quality, productivity, and competitive position of their organization. The seminar is concerned with improving virtually every aspect of the organization's performance. Dr Deming sets forth and discusses his 14 points for management and provides some examples and practical applications drawn from his fifty years of experience. (4 days) (25:Annex)

D. *Basic Graphic Methods for Shop Personnel*. This course is intended to familiarize participants with techniques for structured problem solving and statistical process control. The course provides methods whereby personnel can document processes, problems within processes, identify common and special causes, and establish data collection strategies to statistically monitor processes. (2 hours) (25:Annex)

E. *QMB Methods and Operations*. This course is intended to familiarize participants with management's role in supporting and leading TQM efforts within the Naval Aviation Depot. The course defines the structure that QMBs provide to implement TQM policies. The course also provides methods whereby QMB members can assess processes, problems within processes, identify common and special causes, data collection strategies to statistically monitor processes, and process improvement documentation. Additionally, dealing with the common pitfalls in conducting meetings is discussed. (4 hours) (25:Annex)

F. *Structured Problem Solving and the Basic Graphic Methods*. The purpose of this course is threefold, to teach:

    a.   Structured problem solving techniques;

    b.   The seven basic graphic methods:

         1.   Flow charts
         2.   Cause and effect diagrams
         3.   Pareto diagrams
         4.   Histograms
         5.   Scatter diagrams
         6.   Run charts, and
         7.   Control charts

    c.   The purpose, roles, responsibilities, and hierarchy structure of Quality Management teams. (40 hours for facilitators / 24 hours for all others) (25:Annex)

G. *Analytic Trouble Shooting*. The purpose of this course is to provide a rational and systematic means of solving problems. Students are taught to recognize a problem as a

deviation between the "should" and the "actual." Once a problem is defined, students are then taught a systematic means of accumulating facts, developing and testing possible causes of the deviation, verifying the true cause and eliminating the cause of the deviation. Students are given formal training, practice on case studies and on the job problems, and are provided feedback on their use of the ATS process. Students accomplish their assignments individually and in teams and must give oral presentations on the particular cases to the class. A subset of the course, Potential Problem Analysis, provides students a means of preventing problems initially. The *QMB Methods and Operations* course will also be taught as an element of ATS, and various graphic techniques will be used in the solutions of case studies. (40 hours) (25:Annex)

H. *Group Dynamics*. This course is designed to teach the participants about interaction of people within groups; how to gain support from individuals within groups; and how to deal with problems associated with group activity. This course was specifically developed to be presented to TQM facilitators to assist them in their activities dealing with PATs and QMBs. (8 hours) (25:Annex)

I. *New Employee's TQM Awareness*. This short course will familiarize new employees with the concepts of Total Quality Management, and how these are being implemented at Cherry Point. This course will provide:

     a.   the basic concepts of TQM;

     b.   a view of the TQM structure including QMBs and PATs, and

     c.   a short history of Cherry Points implementation efforts, leading to a summary of current status. (45 minutes) (25:Annex)

J. *Advanced Statistical Process Control*. TO BE DETERMINED - Owing to the lack of appropriate expertise in house, external sources will probably be necessary for this training. (duration to be determined) (25:Annex)

K. *Individual Self Study*. A library of books, magazine articles and video tapes will be established to provide the source material for a course of self study. Participants will be able to refresh their knowledge of TQM, or study an area in greater detail than has otherwise been provided. (duration is as appropriate for each individual) (25:Annex)

L. *Management Continuation Training*. This course will probably be made up of seminars and short courses which provide further insight to TQM, SPC, and their implementation. These will normally be originated outside the depot, but there will be a need to provide some of this training from within. (ongoing) (25:Annex)

M. *Customer/Supplier TQM Familiarization*. This course is intended to familiarize participants with the management theories of Dr W Edwards Deming, and to provide background information on Total Quality Management. The course also provides a basic awareness of the major concepts of Statistical Process Control, and explains why TQM puts so much emphasis on the reduction of variation. It will emphasize the importance of customer/supplier relations to TQM, and will show the importance to Naval Aviation Depot Cherry Point of the customers and suppliers we work with.
        The aim of this course is to encourage the customers and suppliers to adopt TQM as their way of doing business. (3 hours) (25:Annex)

N. *Statistical Process Control Supervisor Application Training*. This course is intended to provide supervisors with the skills to apply Statistical Process Control (SPC) in their area. The course provides practice in construction of charting techniques necessary in applying SPC and practical instruction of the TQM structure and concepts to implement process improvement changes. (40 hours) (25:Annex)

O. *Internal Customer/Vendor Relationships*. This course is intended to provide managers and supervisors with the abilities to identify and apply to their processes customer/vendor requirements. (1 1/2 hours) (25:Annex)

In addition to identifying the courses that must be taught to succeed at TQM, Cherry Point has developed a matrix that shows who the different courses are directed towards, and what priority groups should be given for the course. The matrix is shown in Table 1. The following priority designators are used:

1 -- Essential training for this position.

2 -- Necessary for TQM to succeed.

3 -- Necessary, provide as individually required.

4 -- Beneficial, provide when space is available.

5 -- Beneficial, provide as time and finances allow.

N/A -- Not applicable to this position.

Table 1

NADEP Cherry Point Employee Training Matrix

	Top Mgt	Mid Mgt	Suprvsrs	Work Force	Faciltat	QMB Mmbrs	PAT Mmbrs
A	1	1	1	4	1	3	4
B	N/A	N/A	N/A	1	N/A	3	4
C	1	2	3	5	1	4	5
D	N/A	N/A	3	3	N/A	N/A	3
E	1	1	3	4	N/A	1	4
F	3	3	3	4	1	4	5
G	N/A	N/A	1	4	1	5	4
H	4	4	4	5	1	3	4
I	N/A	N/A	N/A	1	N/A	N/A	N/A
J	N/A	N/A	N/A	N/A	3	3	3
K	3	3	3	N/A	3	3	N/A
L	2	2	3	N/A	2	3	N/A
M	N/A	N/A	N/A	N/A	N/A	N/A	N/A
N	3	3	1	4	3	3	4
O	2	2	1	3	4	2	4

(Note: Course M, Customer/Supplier TQM Familiarization
is geared at customers and suppliers, therefore
it is not available for employees.)

Other methods. Cherry Point has not relied
on a new structure and training. They have also used
customer surveys to asses their internal and external

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customers. Additionally, they have used capitol investment to replace worn out equipment and provide state-of-the-art equipment. This allows the employees to work smarter and have the means provide a quality product (25:6-7).

Gainsharing. Cherry Point is also using Gainsharing. The payouts come from profits resulting from productivity improvements. Individuals with high absenteeism are excluded. Payouts are based on three variables: labor, productivity, and direct and indirect material savings (53:174-175).

Results. The efforts of TQM at Cherry Point are producing results. They have ranked first among all NAVAIR depots in performance indicators for the past five years. The indicators include scheduled versus actual output, cost, and inventory control (24:7).

PATs and QMBs have also produced results. A PAT analyzed time consuming functions manually accomplished in the Accounting Branch. By automating functions that could be economically justified they were able to save $23,000 annually in labor cost and $22,000 in automated data processing cost. Another PAT analyzed the process in the plating and machine shop. They established a part tracking system, ensured proper training for employees, improved communications between the shops, improved maintenance of equipment, and updated equipment. Their efforts resulted in a 73 percent reduction of rework. A separate PAT analyzed the production of the 100-54 compressor. They

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identified problems with the bearing housing, bad carbon seals, and worn turbine rings. They arrived at an O-ring type replacement which reduced retesting by 90 percent (24:8).

A QMB worked on the rework process of the H-46 Rotor Hub. Cracks in the hub were not being detected early on as they should have been. After analyzing the nondestructive test process they changed the procedure and changed equipment resulting in early crack detection. Labor savings amounted to a 29 percent productivity improvement and turnaround time was reduced by 50 percent (24:8).

The Secretarial Employee Participation Group analyzed a persistent problem of errors on outgoing messages. They improved the process by implementing electronic "cut and paste" of messages, developing a help screen, and instituting error tracking. Their efforts reduced errors by 41 percent (24).

These are not the only results from TQM. Investigation into the priming of floor boards indicated it was not necessary, the result was a $9.23 labor savings per unit. Locking high value components in a cabinet at lunch and at night required dismantling and inventorying the parts. Security requirements only required locking the door to the room they were in. Making the change resulted in labor saving of $88.60 per unit. These small improvements result in big benefits. Projected revenues in 1988 were $9.4 million, the actual revenues were $12.7 million. In 1989 a

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loss of $7.6 million was projected, the actual profit was $21.5 million (53:173-174). (Note: The Naval Aviation Depots are industrial funded, which means the equipment users pay the depots for repairs and modifications. By improving their processes Cherry Point was able to complete more work than anticipated resulting in the revenue increases.)

Results have also taken place in non-quantifiable areas. NADEP Cherry Point is responsible for the overhaul of the C-130 aircraft. The majority of the work is to the aircraft systems, and the results are not readily seen. The aircrew would turn in an aircraft with a dirty cockpit, and have the same dirty cockpit after completion of the overhaul. Cherry Point made the decision to clean and paint the cockpit as part of the overhaul process. Although this does not affect the performance of the aircraft, it lets the crew know the plane has been overhauled and makes for a much happier customer. Additionally, the workers like this policy because the results can readily be seen. The workers take pride in turning out a plane that looks new (53:169-170).

Problems. Things were not always clear sailing at Cherry Point. They ran into problems in the early stages of their TQM implementation. One of the first things they did was pass out laminated cards with the 14 points and state they were going to become the new way of doing business. Employees began asking questions about how things

would be done and management did not have the answers. This caused problems in the beginning, the cards were a mistake (53:172).

Another problem was facilitators using statistics to monitor and control processes without the cooperation and support of the employees and supervisors working the process. The facilitators went onto the floor and began analyzing processes with good results. When the facilitators left the process to the workers things went back to business as usual. The problem was the workers were not allowed to "own" their process. The facilitator was. This caused resentment. The places it worked was were the workers took over from the facilitator and said let us do it (53:172).

A final lesson learned was that training must move from the top down. If workers learn statistics before the supervisor they may run into difficulty using their knowledge. The supervisor must understand what is being done so they are not threatened (53:172).

NADEP Norfolk. NADEP Norfolk began their quest for TQM in 1985 when they sent all their senior management to the Deming seminar. The entire work force received awareness training by 1988. Additionally, all managers have received 3 days of training in statistical process control (38).

NADEP Pennsacola. NADEP Pennsacola has incorporated TQM into its five year business plan. They are

providing training to their employees in the necessary tools to make TQM a reality. Teams are established to attack organizational problems (22).

Training is provided to the teams on a just-in-time basis to provide them with the tools they need when they need them. Training includes an overview of TQM, statistical process control (SPC), team leader training, manager/supervisor training, and problem analysis (22).

Additionally, NADEP Pennsacola has a full time statistician working there to help aid in continuous improvement (22).

HQ NAVSUP. HQ NAVSUP is following the Deming management method. Their program is in its infancy, with training having begun in July 1991 (33).

Like HQ NAVAIR, they are recommending the Deming management method to organizations under its command, but not requiring it. The decision is left up to the organizations. If an organizations has an ongoing program or does not believe Deming is appropriate for their environment, they are not required to use it (33).

NAVSUP Charleston. Naval Supply Center Charleston began their TQM program in the summer of 1990. They have developed a mission statement which emphasizes their commitment to providing a quality product, emphasizes the needs of the customer, and strives for continuous improvement.

Training. All top level management has
attended a one day course that teaches the basics of TQM and
the Deming management method. A more detailed, two day
course has been given to mid-level management and
supervisors. All employees have attended a two day
awareness course providing a TQM overview, an introduction
to the Deming management method, and an introduction to
statistical process control (13).

There were 40 facilitators trained by an outside
consultant. These people work as facilitators in addition
to their other duties. Of these forty, twelve attended an
additional one week course that went into greater detail on
TQM methods and provided insight into course development.
These people then developed the awareness training mentioned
above (13).

Surveys. NAVSUP Charleston is conducting a survey
to determine the success of their first year efforts. They
plan on using the results to evaluate their strengths and
weaknesses and determine where additional effort is required
(13).

NAVSUP San Diego. Naval Supply Center San Diego
began following the Deming management method in 1987 (47).
They have a long term commitment to continuous process
improvement based on statistical process improvement,
participative management, and employee involvement (48:7).

Structure. NAVSUP San Diego is using the
structure recommended by NPRDC. They have an executive

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steering committee (ESC), quality management boards (QMBs), and process action teams (PATs) (48:7).

ESC - Executive board of the organization which charters the QMBs. (48:7)

QMBs - Quality management boards, which are permanent, cross-functional teams of managers with joint responsibility for products and processes targeted for improvement. QMBs charter PATs and assign processes to be improved. (48:7)

PATs - Process action teams, which are made up of individuals who have first-hand knowledge of operations and who work on specific issues and problems. (48:7)

All these teams have linking members. One member of the ESC is on each QMB. At least one member of each QMB is on each of its PATs. (48:7).

Training. To bring about continuous improvement NAVSUP San Diego is committed to training for all employees. The Commander and the top 30 managers have received more than 70 hours of onsight training in TQM. All middle managers and supervisors have received at least 24 hours of awareness training. All employees and supervisors receive a 40 hour TQM awareness course. The first hour of this is taught by the Commander to show his commitment to the long-term success of TQM. PATs receive just-in-time training in statistical process control (48:7).

Results. NAVSUP San Diego has experienced success that can be attributed to their TQM efforts. In the personal property area of the Entitlement Division process improvements have lowered customer wait time from an average of 170 minutes to an average of 18 minutes. This increased customer satisfaction while lowering overtime (48:7).

Improvements in workload management, clarifying
operating procedures, and the use of alternative work week
options have resulted in 16 percent reduction in backlogged
warehouse refusals and a 37 percent reduction in spot
inventory codes (48:7).

NAVSUP Puget Sound. NAVSUP Puget Sound is taking
a unique approach to implementing TQM and the Deming
management method. They have developed no formal structure
for TQM, and have minimal training available. The only
course taught is a TQM awareness class. It has been
attended by all the deputies of the various divisions in the
organization. A total of approximately 100 people have
received the training (21).

Included in this three day awareness course is an
introduction to the Deming management method, the 14 points,
and team building techniques. As a result of the class, a
number of process action teams (PATs) that cross
departmental lines have been formed to tackle problems.
Puget Sound hopes that the success of these initial PATs
will enlighten upper management and drive them to work
towards continuous improvement. There are no plans at this
time to formally launch a TQM campaign until early success
can be demonstrated by the established PATs (21).

Puget Sound believes that the workers must be allowed
to do the job and given all support possible. They do not
want start any programs that will come and go with time.
They want the changes in the organization to be cultural

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(21).   As upper management accepts TQM, Puget Sound will

decide whether to begin a formal program along the

guidelines recommended by NPRDC or to continue their

current, low key approach (21).

NAVSUP Pearl Harbor. NAVSUP Pearl Harbor began

their TQM program in August 1990. Since that time they have

created a structure geared towards TQM, and begun training

their personnel (46). .

Structure. Pearl Harbor has adopted the

structure recommended by NPRDC. They have created an

executive steering committee (ESC) composed of senior

management. They have also developed a quality management

board (QMB) to address cross departmental processes (46).

Process action teams (PATs) are formed to address

processes that affect the command, not any one department.

Focus groups are formed within departments to address

problems that are unique to that department (46).

Training. All senior managers have attended

the Deming seminar to learn about the new philosophy and

what it entails (46).

All members of the work force have attended awareness

training. This introduces them to TQM and its goals. It

also provides an introduction to the Deming management

method. Additionally, all members of the work force attend

a class that instructs them on the mission of NAVSUP Pearl

Harbor and its structure to meet that mission. In this class

the role of each department is briefed to allow the

employees to better understand the scope of the work completed and how they fit into the organization (46).

All supervisors attend a four day team leader training course. All employees go through a two and one-half day team member course. The purpose of these courses is to provide instruction in teambuilding, the PDCA cycle, and the graphical methods used in TQM. Where possible, the employees are sent in work groups (46).

Facilitators are used to overcome time delays in training and the need to apply the knowledge taught. When PATs or focus groups are formed a facilitator is assigned to assist them. The facilitator helps in using the PDCA cycle, and provides instruction in any skills that require refresher training (46).

Surveys. Pearl Harbor is using surveys to assess themselves and learn about their customers. A survey of the employees in the organization showed where their strengths and weaknesses are. Communication and teamwork were identified as problems, and are being addressed with team training (46).

Customer service surveys are also being used. The ESC sent a list of 10 questions to each of their major customers, focusing on the long term plans and goals of the customer. They then traveled to the customers location to discuss the questions, and try and to determine how Pearl Harbor can work with them (46).

Other steps. The Commander now conducts interviews of each of the supervisors in the organization, lasting between one and two hours. In these talks he attempts to learn more about the function of each department, their efforts in TQM, and what type of assistance they require to continuously improve (46).

Pearl Harbor also conducts a quality hour one day a week. This hour is used for a number of various activities, including quality training, group discussions, and visiting internal customers (46).

Pearl Harbor now publishes a quarterly newsletter discussing their TQM program. It includes information on successes that can be attributed to the efforts of the organization.

Army.

Red River Army Depot (RRAD). RRAD began their TQM efforts in January 1989. They are attempting to use the Deming management method, but have very little documentation on their efforts.

Structure. RRAD does not have an office dedicated to TQM. Their efforts are built on the existing organizational structure. They have established an executive steering committee that meets quarterly to set policy. Additionally, process action teams are established throughout the organization (9).

The largest indicator of their commitment to TQM and their use of the Deming management method is their quality

mission statement. It identifies the need for continuous improvement, employee involvement, and customer focus. Their mission statement includes phrases such as ". . . continually improve the quality of our products and/or services in order to meet the present and future needs of our customers," and "We will 'build-in' quality rather than 'inspect-in' quality (9)."

Training. Their awareness training for employees consist of a one hour video featuring the commander discussing TQM and its objectives. The supervisors all see an additional video tape four hours in length. This tape includes commercially produced information on TQM (9).

Corpus Christie Army Depot (CCAD). CCAD is new to TQM, they began their implementation in June 1991. They have developed short, medium, and long range goals for their program (35).

The short term goals are to develop courses, train facilitators, and train statistical specialists. These objectives should be met in 1-3 years (35).

Medium range goals include creation of a critical mass of managers trained in TQM and capable of ensuring efforts are sustained in its infancy. The critical mass should be in place in 18 - 24 months. They also hope to establish a learning resource center to provide training in SPC, continuous improvement, math, science, and all areas of interest to the depot. The learning center should be in

place within 12 months. The final medium range goal also deals with training, it is to incorporate TQM into all managerial and technical training on the depot. All medium range objectives should be completed within 3 - 7 years, depending on the level of support and commitment provided by senior leadership (35).

The long range goals call for the training of the entire workforce in the concepts, tools, and techniques of TQM. A support network should be available in both the private and public sector to ensure ideas are freely and openly exchanged. This will help ensure continuous improvement. The final long range goal is to have a cultural transformation. This will make quality a part of every job every day. The entire organization will be focused on quality and the customer. The long range goals should be completed within 10 years (35).

Structure. Included in CCADs plans are the formation of process action teams (PATs). PATs combine members from different work areas joining forces to solve a common problem. Additionally, quality management boards (QMBs) will be formed. QMBs are permanent groups comprised of management responsible for ensuring continuous improvement (35).

Training. CCAD believes that a successful TQM implementation will require extensive training. They have plans to develop training in the following areas: Quality Awareness & TQM Philosophy, Group Development

Skills, Quantitative Methods, Tools of Quality, and Changing

Organization Culture. They plan to develop and provide the

following courses (35).

In-House Training

1. *TQM Awareness/Orientation for Senior Management* --
Key concepts of TQM and enhancing team building skills. (2
days)

2. *General Management Awareness* -- Quality
awareness/philosophy and quantitative methods for process
analysis. (8 days)

3. *TQM Awareness/Orientation for Non-Supervisors* -- TQM
concepts and tools of quality. (1 day)

4. *Total Quality Management/Total Employee Involvement* -
- The 14 points, cultural change, employee involvement,
and problem analysis and solving. (1 day)

5. *TQM Workshop* -- Elements of the Deming approach,
detection -vs- prevention, definition of process with
examples, and relationships of the 14 points. (3 days)

6. *Basic Graphing Methods for Shop Personnel* --
Familiarization with graphics. (1/2 day)

7. *Statistical Training/SPC* -- Basic theory/math
calculations, preparing and using control charts, and
actual examples at CCAD. (4 days)

8. *Structured Problem Solving Using the Basic Graphic
Methods* -- Structured problem solving, seven basic
graphing methods, and purpose, roles and responsibilities
of process action teams. (2 days)

9. *SPC - Supervisory Applications Training* -- Teaching
skills to supervisors, practice in building and
interpreting control charts, and defining and using the
Deming cycle. (4 days)

10. *Group Dynamics* -- Interacting with people in
groups, dealing with group related problems, and
cooperation and teamwork. (2 days)

11. *Organizational Leadership for Executives* --
Strategies for organizational excellence, influencing
subordinates performance, and managing innovation and
change. (5 days)

12. *Train-The-Trainer* -- Provide indepth instruction on TQM principles, tools, and techniques.

13. *Internal Customer/Supplier Relationships* -- Provide managers and supervisors with the abilities to identify and apply to their processes customer/vendor desires. (3 days)

Contractor Provided Training

14. *Executive Awareness Seminar* -- Working knowledge of the quality process and senior managements role in the success of TQM. (2 days)

15. *TQM Workshop* -- Provide management with understanding of putting principles into action creating plans that are pitfall free. (2 days)

16. *Statistical Awareness for Senior Executives* -- Provide working knowledge of statistical techniques and learning to make decisions on process changes. (2 days)

17. *Quality Management Team Workshop* -- Assisting second and third level managers in developing plans to coincide with top level plan. (1 day)

18. *Quality Seminars for Managers and Professionals* -- Review principles of TQM and application to professionals. (1 day)

19. *Quality Seminars for Supervisors* -- Provide supervisors with methods for developing groups into strong problem solving teams. (2 days)

20. *Employee Quality Involvement and Part cipation Seminar* -- Promote management/employee discussions on quality and focus on planning initial activities to motivate employee participation. (1 day)

In addition to identifying the courses that must be taught to succeed at TQM, CCAD has developed a matrix that shows who the different courses are directed towards, and what priority groups should be given for the course. The matrix is shown in Table 1. The following priority designators are used:

1 -- Essential training for this position.

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2 -- Necessary for TQM to succeed.

3 -- Necessary, provide as required.

4 -- Beneficial, as space is available.

5 -- Beneficial, provide as time and funding permit.

N/A -- Not applicable to this position.

Table 2

Corpus Christie Army Depot Employee Training Matrix

	Top Mgt	Mid Mgt	Suprvsrs	Work Force	Faciltat	QMB Mmbrs	PAT Mmbrs
1	1	1	1	N/A	2	N/A	N/A
2	1	2	N/A	N/A	N/A	N/A	N/A
3	N/A	N/A	N/A	1	2	N/A	1
4	1	1	2	N/A	N/A	N/A	N/A
5	1	2	3	5	3	N/A	N/A
6	3	2	2	1	1	1	1
7	3	3	3	1	1	1	1
8	2	1	1	1	1	1	1
9	5	4	1	5	4	3	5
10	1	1	1	1	1	1	1
11	1	N/A	N/A	N/A	N/A	N/A	N/A
13	1	2	2	N/A	N/A	N/A	N/A
12	1	N/A	N/A	N/A	N/A	N/A	N/A
15	1	2	3	N/A	3	N/A	N/A
16	1	2	N/A	N/A	N/A	N/A	N/A
17	1	3	N/A	N/A	5	N/A	N/A
18	1	4	N/A	N/A	3	N/A	N/A
19	N/A	N/A	3	N/A	N/A	N/A	N/A
20	4	4	3	1	2	N/A	1

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This matrix shows the need to provide a variety of training to all employees. It identifies the minimum training required for all employees for a successful TQM program. Developing a matrix of this type is beneficial to all employees. It not only tells them what they should take, but what is available to take. It also identifies what training managers and supervisors have received, providing employees an insight into what type of information the supervisor can provide.

CCAD believes it is essential to have a sincere commitment from senior management. Senior managers must be among the first to receive extensive training to ensure a successful implementation.

Letterkenny Army Depot (LEAD). LEAD is placing the customer high in their priorities. They are working towards continuous improvement with an emphasis on the customer. This customer emphasis is seen in their fundamental philosophy, which states: "Letterkenny Army Depot will be the Army leader in providing timely, high quality, cost effective products and services to our customer (58)."

Necessary changes. They believe this goal will be achieved when the following changes take place, and everyone in their organization:

1. Focuses on their customer.
2. Strives to continuously improve their processes.
3. Seeks to create an environment of integrity and mutual trust.

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4. Demonstrates commitment to changing depot culture.
5. Seeks to increase our flexibility to acquire and manage resources.
6. Provides the proper training at the proper time.
7. Develops valid measurement systems for our processes.
(58)

Training. In an effort to make all this possible LEAD is committed to training. The first step in the training process is awareness training. All existing and new employees are given eight hours of training in general TQM philosophy and eight hours on the tools and techniques used (58).

Team training is given to members of process action teams on an as needed, or "just-in-time" basis. This is to ensure the lessons taught are fresh in the minds of team members when it is needed. This training includes TQM overview, team training, conflict resolution, and the tools and techniques of statistical process control. Additionally, process improvement consultants are available to help the teams and managers (58).

Management is trained in customer service and leadership. The Deming seminar has been attended by 112 upper level managers to ensure they understand the philosophy and can assist in the transformation (58).

New Cumberland Army Depot (NCAD). NCAD will become a part of Defense Distribution Region East (DDRE) along with Defense Depot Mechanicsburg Pennsylvania (DDMP) and 7 other organizations. DDMP and NCAD are both attempting to use the Deming management method. They are

unclear of what the new organization will do to their programs. They do not know if they will be forced to change or allowed to proceed with their current program (14).

They are conducting a TQM overview course to provide employees with basic tools, theory and planning. They provide additional team building and statistical process control training on a just-in-time basis (14).

Sacramento Army Depot (SAAD). SAAD began their Deming based TQM implementation in early 1988. They received early assistance and training from the Navy Personnel Research and Development Center (NPRDC). SAAD has adopted the structure recommended by NPRDC to incorporate TQM into the organization (10).

Structure. SAAD uses an executive steering committee (ESC), quality management boards (QMBs), and process action teams (PATs). These teams form the basis for their efforts. SAAD has 20 in-house "consultants" who have received indepth training in statistical process control and team interaction. The consultants provide assistance and training to the various teams (10).

Training. SAAD has developed numerous courses to provide employees with the tools necessary to continuously improve. Statistical tools are taught to teams on a just-in-time basis by the in-house consultants. They are taught at the appropriate time they will be used during the plan-do-check-act cycle. The following courses are taught at SAAD:

New Employee Workshop (4 hours) (10)

Middle Management Seminar (8 hours) (10)

Top Management Overview (3 hours) (10)

Basic Concepts of Quality Management and Introduction to Statistical Thinking (40 hours) (10)

Implementation Planning Workshop (20 hours) (10)

Implementation System Workshop (8 hours) (10)

Structured Problem Solving and the Basic Graphic Methods (40 hours - trainers course) (10)

Advanced Problem Solving and Analytic Methods (40 hours) (10)

Results. The TQM efforts of SAAD are producing results. Process improvements in the Bradley Integrated Sight Unit have resulted in an increase in production from 13 to 20 units per month. They have reduced manhours required by 86 hours for a per unit savings of $4,300. Parts reductions have provided a $1,700 per unit savings (10).

The PVS-4 Light Intensifier Device process was improved resulting in a 68 percent manhour reduction. This translates into $329 per unit, or $60,563 per year (10).

Anniston Army Depot (ANAD). ANAD has been involved in TQM for approximately three years. All senior leaders have attended the four day Deming seminar to provide insight into and understanding of the Deming management method. All employees receive a three hour awareness orientation (2).

Additional training is provided in team leadership for
supervisors and team leaders. A general overview of
statistical process control is given to all employees in a
four hour class (2).

Defense Logistics Agency.

Defense Personnel Support Center (DPSC). DPSC
began implementing TQM in May 1990. They have identified
their commitment in their mission statement. Additionally,
their strategic plan has included their commitment to TQM
(59).

In the past year they have provided awareness training
to all of their over 4,000 employees. This training
consisted of 4 hours of background on TQM, the 14 points,
and identification of barriers to implementation. This
portion of the training was provided by a contractor. An
additional 2 hours of training was provided by either the
commander or one of his deputies to demonstrate their top
level commitment. This portion of the training included a
DPSC overview, background on why they were committing to
TQM, and how it fits into the organization (59).

Defense Depot Mechanicsburg Pennsylvania (DDMP).
DDMP will become a part of Defense Distribution Region East
(DDRE) along with New Cumberland Army Depot (NCAD) and 7
other organizations. DDMP and NCAD are both attempting to
use the Deming management method. They are unclear of what
the new organization will do to their programs. They do not

know if they will be forced to change or allowed to proceed with their current program (14).

They are conducting a TQM overview course to provide employees with basic tools, theory and planning. They provide additional team building and statistical process control training on a just-in-time basis (14).

Questionnaire Results

A questionnaire was sent to three separate organizations committed to the Deming management method. Two of the three responded and their responses are included below. The third organization did not submit their respons in time for inclusion in this document. The questionnaire is modeled after questions developed by William Scherkenbach used to determine the understanding and execution of Deming's 14 points by an organization, and presented in his book *The Deming Route to Quality and Productivity* (36:142-144). The purpose of the questionnaire was to gain insight into how each organization is applying each of the 14 points. The organizations who responded are: the Foreign Technology Division (FTD) of the Air Force Systems Command, providing insight into the use of Deming in an organization providing an information service; and Naval Aviation Depot Jacksonville (NADEP Jax) providing insight into the use of Deming in an organization providing a maintenance function.

There were 27 questions asked, each categorized under one of the 14 points.

This section presents the responses to the questions. Reviewing these answers will help gain a better understanding of how the Deming management method works. The responses were provided by Lynn Steinhilber, NADEP Jacksonville (NADEP Jax) (41) and Major Dan Turgeon, FTD (51).

Point 1.

1. Has your organization established/published/disseminated its mission statement? What is it?

NADEP Jax:

Yes, it has been published and disseminated. It says:

The mission of Naval Aviation Depot Jacksonville is to provide a full range of high quality maintenance, engineering, logistic, and support services to the Fleet at a competitive price.

Guiding Principles

Customers are the focus of everything we do. Our work will be done with our customers in mind, providing better products and service than our competition.

Quality comes first. To achieve customer satisfaction, the quality of our products and services will be our number one priority.

Continuous improvement is essential to our success. We will strive for excellence in everything we do: in our products; in their safety and value; and in our services, human relations, and our competitiveness.

Employee involvement is our way of life. We are a team. We will treat each other with trust and respect.

Integrity is never compromised. The conduct of our facility will be pursued in a manner that is socially responsible and commands respect for its integrity. (41)

FTD:

Yes, the mission statement is:

The Foreign Technology Division is the free world's leader
in foreign aerospace scientific and technical
intelligence.

Purpose: To provide our customer with information and
data about foreign aerospace systems, subsystems, and
technologies which have military potential.

Fundamental Values:

People - Our most important asset is our people. They are
the source of our strength, vitality, ingenuity, and
reputation.

Customer - Our customers depend on us. We play a critical
role in their ability to satisfy their missions. FTD
exists only to meet their needs.

Culture - Our work life is a vital source of personal
satisfaction and growth. How we go about accomplishing
our mission is fundamental to our long-term effectiveness.

Product - Our products and services are critical to the
security of the United States.

Trust and Respect - Only in an atmosphere which values
individual differences and where there is mutual trust
between and among individuals is there hope of fostering
innovation and continuous improvement.

Guiding Principles:

Quality comes first - Our products and services are one of
a kind; they must be as accurate, as timely and as easily
comprehended as we can make them.

Support to our customers is the focus of everything we
do - we must know our customers well. Our products and
services must satisfy their needs.

Continuous improvement is essential - we cannot satisfy
the expanding and evolving needs of our customers without
continuous improvement.

Integrity is critical to our processes and assessments -
our judgements must be based on knowledge and experience
and cannot be influenced by politics or preconceived ideas
or notions.

Our work environment must stimulate employee involvement, job satisfaction, pride, trust, teamwork, and cooperation - these are crucial to innovation, creativity, product quality, and our long term success.

A cardboard (suitable for framing) version was given to each employee. New employees receive it in our TQM awareness training. (51)

Comments. The mission statements of these organizations show their long term commitment to TQM. The statements emphasize the need for quality products and services, the need to treat the people in the organization with respect, the need to focus on the wants and needs of the customer, and the need to improve continuously. These mission statements provide the organizations with a good foundation and starting point for their TQM plans.

2. How do you know it was understood?

NADEP Jax:

The Commanding Officer briefed it to all employees and explained the meaning. (41)

FTD:

Through discussions in our class (all attend). (51)

Comments. NADEP Jax does not have a good method of determining if the mission statement was understood. Just because the Commander briefed the mission statement does not mean the people understood it, One possible way of correcting this would be a survey of employees to determine their understanding of the mission. It is imperative that the people know what the mission and principles of the organization are if they are expected to contribute to meeting them.

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FTD's method of discussing the mission statement in
class should provide a better understanding of the mission
statement, but there should still be a follow-up survey.
The survey will gauge just how well the message is being
understood.

3. How do you know the mission will not change when
you get a new commander?

NADEP Jax:

We have had three commanding officers since we developed
our mission statement, and it has not changed. (41)

FTD:

We have tried (and continue) to make a cultural change in
our organization which should transcend any change in
command. Also, we are currently in a command which
strongly believes in our approach. We are changing to a
new command which will present a new challenge, but one we
are up to.

Comments. These responses point out the need for
cultural change. It appears that NADEP Jax is having good
success in changing the way they do business since they were
able to survive three changes in commanding officers without
a change in their mission statement and its principles.

FTD has not undergone a command change since beginning
their program. They understand that a new commander may
threaten the way they now do business. Recognizing this
fact will help them to create the cultural change necessary
to weather any command changes that may affect their
program.

Point 2.

4. How is the Deming philosophy part of your training?
Is it incorporated at all levels?

NADEP Jax:

We have developed a course in the Deming philosophy and
SPC and are teaching it to all employees. We have not yet
completed training all employees. (41)

FTD:

It is the back bone of our training, although we do
incorporate the teachings of others where they complement
his philosophy. (51)

Comments. NADEP Jax is presenting teaching the Deming
philosophy to all employees. This will help the personnel
to understand what the organization is doing and why. It is
important that all training classes be reviewed to ensure
they are consistent with and reinforce the Deming
philosophy. FTD appears to be doing this by making Deming
the back bone of their training.

5. How do you identify your customers needs?

NADEP Jax:

We conduct customer surveys, internally and externally.
We also visit each of our external customers
periodically to get customer feedback on the quality of
our products. (41)

FTD:

We have conducted extensive surveys with follow-up
telephone interviews. Our commander has funded and
continues to support TDYs for our analyst to visit our
customers to determine their changing needs. We also have
an extensive customer training program and host numerous
conferences for feedback. (51)

Comments. The use of customer surveys is essential to
successfully apply the Deming management method. These

organizations are surveying both internal and external customers to ensure they are providing the product the customer wants and needs. Customer visits are also being used to learn first hand what the customer does with the product being provided. This provides a better understanding of why the customer needs things done certain ways. By seeing and understanding how the end product is actually used the organization can better determine how to create the product. These organizations will greatly benefit from their surveys.

Point 3.

6. Where do you rely on mass inspection to assure quality?

NADEP Jax:

We only conduct inspection on flight critical process. (41)

FTD:

Since our products are one of a kind we have never had such a problem. However, multiple coordination layers have been a problem, and we have drastically reduced them. (51)

Comments. NADEP Jax retains the use of inspection for processes that are flight critical, that is, a failure could result in the loss of life and aircraft. The consequences of a failure far outweigh the cost of inspection.

Each product produced by FTD is unique, that is they are providing intelligence which is rarely the same twice. The product produced is always changing. Mass inspection in this environment is actually mass coordination. FTD is

reducing coordination layers, which means streamlining their operations. This pushes authority farther down the chain towards the worker providing them more responsibility. This is a good approach to reducing mass inspection in a non-manufacturing environment.

7. What are you doing to eliminate it?

NADEP Jax:

We have an artisan certification program, whereby trained, certified artisans are checking each other's work periodically, rather than having a quality assurance specialist verifying the work. We are also implementing SPC which tells us whether our processes are capable and in control. (41)

FTD:

Upper management intervention and process action teams are continually reviewing to eliminate unneeded coordination. (51)

Comments. The artisan certification program of NADEP Jax is a good way of not only reducing their reliance on mass inspection, but also of empowering the workers, which should increase their job satisfaction.

The use of SPC was not mentioned, but it could be a part of any program aimed at reducing mass inspection. SPC allows the process to be monitored and kept in control to ensure quality products are produced.

Point 4.

8. What steps have you taken to stop awarding business on the basis of price tag alone?

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<u>NADEP Jax</u>:

We are better defining our quality specification, so that vendors have to meet quality as well as price criteria. (41)

<u>FTD</u>:

We have gone to life-cycle cost for competitive competition with 5 year contracts to help build relationships. Sales price is no longer the sole determinant of selection. (51)

<u>Comments</u>. NADEP Jax has identified the need to make quality a part of the contracting process, but have not provided details on how this is done. It is not clear if quality is part of the criteria used to award a contract or just a part of the requirements. Quality should be a part of the award process and considered as well as price. Contractors should be required to present their quality track record and their quality program.

The use of life-cycle cost allows FTD to look at the big picture when they are buying things. They can look at all cost involved in the acquisition, not just the upfront cost. This will allow them to make a better decision. Additionally, FTD is using a good approach to build a longer term relationship than the typical one year used in the DOD. By awarding five year contracts they are showing their commitment to the contractor. Five years allows the contractor time to invest in improved methods of meeting the contract requirements and have ample time to cover cost incurred and still be profitable.

9.   What have you done to develop single-sources of supply?

NADEP Jax:

Under current congressional law, we are required to use the competitive bid process in most cases; therefore, we are unable to develop single sources of supply. (41)

FTD:

See above. Our hope is that by developing supplier relationships with longer contracts in the long run they will be able to better compete for contracts at renewal. The best we can do under current law. (51)

Comments. This is a difficult area to work in since single sources of supply are not allowed by law except under certain circumstances. The FTD approach is an innovative way of working within the law and still establishing somewhat long term relationships.

Point 5.

10.   Where are you using the PDCA cycle?

NADEP Jax:

The PDCA cycle is used by Process Action Teams (PATs) in the analysis of processes. (41)

FTD:

As process action teams review existing processes, the PDCA cycle is used. We teach it to every new employee. It is also followed when conceiving new projects. (51)

Comments. The use of the PDCA cycle by these organizations shows they are trying to take a logical, well planned approach to improvement. It is being used by PATs as would be expected. FTD is showing a commitment to improving all aspects of their business by expanding it to new projects. This will help ensure new projects are well

planned with a logical project development. These
organizations must remember that the PDCA cycle is never
ending, and continue to use it on processes after they are
improved to ensure continuous improvement.

Point 6.

11. What have you done to ensure employee's are
properly trained in their job?

NADEP Jax:

We have developed and conducted artisan refresher training
in each of our skills. (41)

FTD:

This is an area that received a lot of interest. We are
chartering PATs to review just how people receive training
in each specialty we employee and identifying the
processes and recommending courses of training. (51)

Comments. The use of refresher training by NADEP Jax
is a good approach to ensuring their artisans are properly
trained and do not lose any of their skills. They must
provide the refresher training on a continuing basis.
Additionally, they should look at their white collar
training to ensure all employees are adequately trained in
their job.

FTDs use of PATs to review each specialty area is an
excellent concept. This allows a thorough review of all
jobs and ensures the proper training needed is identified.

The organization should use surveys to test the
knowledge of employees. This will help identify any areas
that require training and also any weaknesses in the
training provided.

12. What systems that would hinder the effectiveness of training have you changed for the better?

NADEP Jax:

We now conduct post-training surveys to check for retention and usefulness. Some of our training, such as that for SPC, is now being done in a just-in-time mode; i.e., we teach a portion of the training and then work with the students as they directly apply it to their work processes. We are also utilizing video to train our people in the right way to do the job. (41)

FTD:

We are still examining, but just knowledge of what is available is a problem. Most training is seat of the pants and supervisor dependent by specialty. We are trying to establish a clear process. Work will continue over the next couple of years. (51)

Comments. NADEP Jax provides two good ways of improving the effectiveness of training, follow-up surveys and just-in-time training. Follow-up surveys are a good way to improve the effectiveness of training. They not only test the knowledge of the individuals attending, they also ensure the proper material is emphasized. If an area is not being well taught it will become evident in the follow-up survey. This will allow the course to be modified as needed.

By providing training on a just-in-time basis employees are given the necessary skills when they are needed. This is appropriate for people involved with a PAT or some other type of team. Training the PAT in SPC when they are collecting data allows them to immediately use their new knowledge while it is fresh in their mind. If the class was taught to the PAT members six months before formation of the

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team the information may very well be forgotten. In this case the training would have been wasted.

FTD identifies this area as a weakness in their program, and they are working (using PATs) to identify ways of improving training.

Point 7.

13. What are your criterion for giving feedback?

NADEP Jax:

We have developed and conducted training for all supervisors in how to give direct, specific and non-punishing feedback to employees regarding performance. (41)

FTD:

We have several avenues, including an online system, TQMNET. Each suggestion is assured of being acknowledged within 2 days with a plan to either implement, study, or reject for cause the suggestion. The later has been strongly discouraged by our Commander unless a good and sound justification exist. (51)

Comments. The organizations do not provide specific criterion for giving feedback, but they do provide insight into their programs.

The response of NADEP Jax indicates they are attempting to transform supervisors into leaders through training. Showing the supervisors how to constructively give feedback is an important part of making them leaders. This is a process that will require time, as people do not change quickly.

FTDs answer shows they place importance on providing sound justification for turning down suggestions. This must

be carried through and sound justification given to an employee whenever negative feedback is provided.

14. What have you done to turn your supervisors into leaders?

NADEP Jax:

Training, training, and more training. (41)

FTD:

We are working this. All our upper management have received some training. All our supervisors are receiving Team Building training which we have revised with an upper manager presenting a two hour segment on leadership. We are also developing a text for further training in this area.

Comments. These responses indicate there are no easy techniques to transforming supervisors and managers into leaders. They emphasize the need for training in how to work with people. Only open minds, training, and time will change supervisors into leaders.

These organizations should look to the employees to get feedback on the leadership training given to the supervisors. The employees can be surveyed over time to see if their attitudes toward the supervisors change following the supervisor training. Changes in the supervisors for the better or worse will be reflected in the employees attitudes. The surveys will also provide insight into the areas where supervisors require additional training.

Point 8.

15. What are you doing to reduce fear?

NADEP Jax:

We have removed time standards from the performance
appraisal system and from the work documents. We conduct
an attitude survey annually of a random sample of our
employees and then address those issues. Our Commanding
Officer briefs employees monthly on items of concern. Our
Civilian Personnel Department puts out a rumor control
paper to address those issues that employees identify as
the latest rumor regarding security. One of our senior
managers conducts a "workday" once a month; i.e., dons
blue jeans and spends a day working in various shops in
the organization. He not only gets a taste of the
frustrations felt by the artisan in trying to get the job
done but it also provides an opportunity for open
communication in a non-threatening environment. (41)

FTD:

The Vice Commanders our champion on this. We are becoming
increasingly open in all matters in the hope that through
knowledge 'fear' is reduced. The upper command has
stressed that our people are our #1 priority. In our
recent Defense Management Review (DMR) cut we were able to
use attrition and not layoffs or early dismissals to cover
cutback's. (51)

Comments. NADEP Jax is taking great strides in

attempting to reduce fear. Their efforts will clearly show

the employees that the organization is changing, and there

is no reason to fear the supervisor or manager. Having

senior managers spend time in the workforce, removing time

standards from appraisals, and publishing an informative

newsletter are good approaches to driving out fear. What

makes their program even better is the use of surveys to

determine the success of their efforts. The surveys will

allow them to determine where they are succeeding and where

more work is needed.

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Using attrition to reduce the workforce shows FTD is doing more than just preaching the new philosophy to their people. It shows they are trying to live it.

Point 9.

16. How are you breaking down barriers between departments?

NADEP Jax:

We are conducting "Ask the Supervisor" sessions with first and second level supervisors once a month where senior management asks supervisors what's keeping them and their employees from being able to do their jobs efficiently and effectively. Issues brought up form the basis for process improvement throughout the plant. We have also established a Process Improvement Suggestion Program whereby any employee can identify any process that is not working effectively, and management will take action to improve the process. Many of our Process Action Teams are cross-functional, which also helps to break down communication barriers as teams work together to solve problems and improve processes. (41)

FTD:

Steering Committees, cross-deputate process action teams, and open communications are all ways of breaking down fifedoms. (51)

Comments. These organizations are using cross departmental teams to bring people together and breakdown barriers. This approach is necessary to not only remove barriers, but to allow departments to meet their customers and continuously improve. It is important to know what the customer wants and needs in order to improve the product being provided. Teams often bring the customer and supplier together and allow for the exchange of this information.

NADEP Jax's Ask the Supervisor sessions are a good method of identifying barriers. They may want to include

some non-supervisory employee's in them get a better picture

of the work force.

Point 10.

17. What do your people consider meaningless slogans?

NADEP Jax:

Anything that asks people to achieve better levels of
performance without providing a means of accomplishing
what's being asked of them. (41)

FTD:

Anything that places the onerous without providing a means
for that individual to accomplish it, like: 'Security is
Your Responsibility' has no clear guidance. Our people
keep us honest and our TQ shop is very sensitive to it.
(51)

Comments. These responses show that it is not easy to

determine if the employees know what meaningless slogans

are. The responses basically provide an explanation of

Deming's point 10. FTD does give an example of a typical

"meaningless slogan." The slogan provided states employees

are responsible for security, but does not provide any

procedures or methods that should be followed. It simply

tells the people what they should do, not how to do it.

18. How do you know?

NADEP Jax:

"Meaningless slogans" is a topic covered in our TQM
training. If they never thought about it in those terms
before, they do after the training. (41)

FTD:

Our people keep us honest and our TQ shop is very
sensitive to it. (51)

Comments. NADEP Jax's statement indicates training

must be provided to ensure people are aware of meaningless

slogans and can point them out to management. To ensure

employees actually understand what a meaningless slogan is a

follow-up survey should be used. The organizations do not

indicate that this is currently being done with their

surveys.

Point 11.

19. How do you measure a full days work in

administrative areas?

NADEP Jax:

We don't. (41)

FTD:

A lot of trust is placed on our people. We do have an
accounting system where the individual inputs his/her own
data. Not a perfect system, but one that we are working
on. The better line is there is no standard and people
are responsible to do their job, management causes any
problems. (51)

Comments. These responses do not provide any

significant insight into what is being done to eliminate

numerical quotas. NADEP Jax states they are not using any

numerical quotas in administrative areas. It is not clear

if this is a new way of doing business resulting from the

adoption of the Deming management method, or is business as

usual.

FTD is actually using a numerical system to measure a

days output. They recognize their system is not perfect and

is being worked on. Their response eludes to the fact that

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there should not be any type of numerical quota system, but
does not indicate if they plan to do away with it.

20. How are you eliminating work standards?

NADEP Jax:

We aren't eliminating work standards. We have removed
time standards from performance appraisals and from work
documents. Time standards are used only for planning and
financial purposes. Employee's still have work standards
which tell them what's expected of them and defines to
some degree the quality that is expected. (41)

FTD:

We really have none, but the merit appraisal system has
been changed once in the last year, and we are seeking to
either further improve or abolish it.

Comments: NADEP Jax indicates work standards are still
used to let employees know what is expected of them and to
some degree to define quality. This could present problems.
Unless all of the 14 points are truly a part of the
organizations culture the employee may try to meet the
standard for fear of consequences. Additionally,
supervisors may unconsciously use the standards to rate
employees. Ideally the employees should be properly trained
and skilled in their job to alleviate the need for any
knowledge of the standard. The only function of the
standard should be to develop prices when bidding on work.

Point 12.

21. Have you surveyed your organization to identify
barriers to continuous improvement?

NADEP Jax:

Yes. Approximately a year ago, we had an external
organization, Navy Personnel Research and Development

Center, conduct a TQM survey to help us identify those
areas we are still weak in as well as those areas in which
we are improving. (41)

FTD:

Yes, twice in the last two years. These are areas that
the executive steering committee continues to work. (51)

Comments. These organizations are making excellent use
of surveys to determine where they are strong and weak.
Surveys must be used in an ongoing manner to track any
changes in the organization over time. They will have a
definite impact on making continuous improvement possible.

22. How are you eliminating these barriers?

NADEP Jax:

Some of our senior managers are meeting with employees
periodically to address their questions and concerns. We
also have a Middle Management TQM Team which is analyzing
the results of this survey and developing plans of action
for addressing barriers. Process Action Teams are also
working to remove barriers to continuous improvement.
(41)

FTD:

A variety of ways, see 16 above -- same applies. Also,
increased emphasis on quality training and training in
quality techniques (SPC, etc). (51)

Comments. The responses do not provide actions or
plans being used to overcome any specific barriers, but they
do provide good insight into what steps need to be followed.

Chartering a PAT responsible with analyzing survey
results and developing plans of action ensures the results
are reviewed and understood. It is important that the PAT
have representatives from as many departments as possible to
ensure all areas covered by the survey are understood. PATs

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must then be chartered as needed to attack and overcome the barriers identified.

FTDs emphasis on training is geared towards continuous improvement of the process. Their answer implies that lack of training in continuous improvement methods is a major obstacle to achieving continuous improvement. Providing employees the tools needed and allowing them the opportunity to use these tools will allow them to overcome the barriers.

Point 13.

23. What training are you providing to your employees to prepare them for the future?

NADEP Jax:

The NADEP interprets the Federal Personnel Manual 410 as saying that all training given to employees must be directly job related. Therefore, the only "futuristic" training we provide for employees is for new workload we will be assuming. (41)

FTD:

Awareness and team building are the current focus. FTD also has one of the best education/training programs I have seen, including an in-house Masters Degree program through the Defenses Intelligence College. (51)

Comments. NADEP Jax is taking a conservative approach to training for the future. They should make courses available to the workforce to obtain new skills. If they cannot provide anything on base, they should help identify training off base that employees can seek.

FTD recognizes that any TQM related courses will benefit the employees and help them in any future jobs. The in-house Masters Degree program is unique and innovative.

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Allowing employees to further their education in-house
benefits both the person and the organization. The
additional education will provide them new perspectives for
looking at their work. It will also provide new skills that
will make them more adaptable to future change.

24. How do you measure the success of your training?

NADEP Jax:

Post training surveys and by the employees' ability to
apply the training. In one particular case, we
assimilated data regarding numbers of back injuries on the
job, conducted training, then compared the before and
after incident rates. This gives a gage of how effective
our ergonomics training has been. (41)

FTD:

Feedback surveys and student recommendations. (51)

Comments. These organizations will benefit greatly
from their use of follow-up surveys to measure the
effectiveness of training. The surveys will tell how well
the training was understood and provide insight into areas
requiring improvement.

NADEP Jax used a sound approach to measuring the
effectiveness of their ergonomics training. By comparing
incident rates they will be able to determine if the
employees truly learned the new methods or if additional
training is necessary.

FTD should try to develop performance measures to
evaluate their training as NADEP Jax has done with their
ergonomics training. Performance measures serve as an
excellent indicator of the effectiveness of training.

Developing a baseline may be difficult in many areas of their work, but should be used when possible.

Point 14.

25. What has been done to signify it is no longer business as usual?

NADEP Jax:

We have established a TQM structure which overlays our existing organizational structure. Our executive board is also our TQM Executive Steering Committee. We have Department, Division, and Branch Quality Management Boards. We have included a performance element in all supervisory appraisals indicating what is expected in regards to implementing TQM. Active participation in implementing TQM is also a factor in supervisory promotions. TQM is always a topic of discussion when our Commanding Officer briefs our employees. (41)

FTD:

A member from the Executive Steering Committee kicks off each Awareness course and returns for questions at the end. Each team building course is kicked off by a Command level individual (i.e., Commander, Vice-Commander, Chief of Staff, Chief Scientist, or at least some one in SES grade). A senior manager (O-6, SES) also teaches a two hour block. Our executive TQM steering committee meets for 90 minutes each week. These are open meetings, and involve the dedicated time of four O-6s, three SESs, one CMSgt, and a GS-15. Each two letter organization has their own TQM steering committee meeting weekly to handle items from the workforce. The Commander publishes regular letters. TQM process improvements are a topic at each Commanders' Staff meeting. And on and on. Every one knows that changes are afoot! (51)

Comments. These organizations both indicate the Commander is actively involved in TQM, and discusses it often. This is an excellent way to indicate to the employees that it is not business as usual. Having the Commander dedicate time to changing things shows commitment. It is important that all levels of management focus

attention on change and show their commitment. FTD indicates there are weekly meetings held to openly discuss the changes taking place and changes that need to take place. It is important that the ideas and changes discussed in these meetings be put into action. If not, the workforce will quickly see that the desire to change is not sincere.

Developing a TQM structure will signify things are changing only if it results in actual change. It is important that the new structure provide a way to improve the organization. It must not be a paper tiger that only complicates the process.

To determine if the new structure is providing a change for the better employee surveys can be used. They would evaluate behavioral changes in the organization. The survey would provide a baseline to determine how the employees have changed overtime as a result of the TQM program. Additionally, the survey could provide insight into the employee's perception of management and changes in management over time. It will show if management is truly walking-the-talk or merely feeding the paper tiger.

26. To whom do you go for statistical advice?

NADEP Jax:

We have a statistician and a statistical assistant on the TQM staff to provide statistical advice. (41)

FTD:

The contractor QUALPRO. Plus, we have a Statistical Support Group led by a PhD. (51)

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Comments. These organizations are showing their commitment to the Deming management method by developing an in-house statistics capability. Having an in-house capability will allow quicker resolution of problems and provide training in basic techniques. It is important that the statisticians be available to support the workforce.

27. What steps have you taken to transform your organization?

NADEP Jax:

See answers to questions 1-26 above. (41)

FTD:

A lot of this is listed in the questions above. The data fills a book case. It's happening, but as with any cultural change it is still infantile. (51)

General Observations

NADEP Jax. NADEP Jax has developed a good program and approach to implementing the Deming management method. They have top level commitment that has remained strong through three changes of command. This indicates that a cultural change is taking place and they are well on their way to world class quality.

NADEP Jax should not accept all the DOD rules as final. They indicated they can not go to sole source suppliers and can not provide additional training do to laws and regulations. They should look for more creative solutions of working within the laws as FTD has done.

NADEP Jacks should be commended for its fine efforts towards cultural change and continuous improvement. Their

survey responses indicate they are sincere about
transforming their organization.

FTD. FTD is still in its infancy in their quest
for TQM. They are fortunate to have a sincere commitment
from top management that should allow them to succeed. FTD
has shown ingenuity and creativeness in developing their
program and spreading the word to the employees. The size
of FTD works to their benefit. They have approximately 1700
people in one location. This allows for greater visibility
of the Commander and of the efforts by work force.

FTD must not allow the early momentum they have created
to stop. They must continue to provide training and
maintain their commitment to ensure a cultural change
occurs. Their efforts can serve as an example for
organizations seeking to change.

V. Conclusion and Recommendations

Conclusion

Research objectives. This study has successfully achieved its objective to answer the two research questions:

Is there evidence that the Deming management method is being used to achieve TQM in DOD logistic organizations? and,

If there is evidence that the Deming management method is being used, what techniques are used to implement each of the 14 points?

After holding extensive phone interviews with DOD logistics organizations, it was determined the Deming management is indeed being used to achieve TQM. Twenty-one of the organizations contacted claim to be using the Deming management method (a short list is included in Appendix C.)

The techniques used to implement each of the 14 points have been documented. They appear throughout the descriptions of each program presented in Chapter 4 of this document. Additionally, in an effort to better understand how to implement the 14 points, each point is listed in the Recommendations section of this document with the applicable techniques explained.

Keys to success. Two key points to achieve success with the Deming management method, or any program used to implement TQM, have become apparent during this study. These key ingredients are commitment and training.

Commitment. All members of the organization must be committed to quality, the customer, and continuous improvement. Commitment from the upper management of the organization must come in the form of time and money.

The commander of an organization and all senior leaders must be willing to devote their time to making the program work. They must be available to listen to the workers and provide guidance. They must attend training to learn about the new philosophy and what they can do to make it a reality. They must be willing to challenge and change the "normal" daily practices of the organizations. Finally, they must allow the change to occur.

Money must be devoted to the program. In order to be successful training is required. Training takes money for materials and instructors as well as the cost incurred for the employee to be away from the job. In the case of TQM money must be spent before money can be made. Personnel must be trained and instructed in the methods of continuous improvement before changes occur that result in a better, more profitable system.

Money is also needed for process improvements. Equipment will most likely need upgraded, moved, and/or maintained as part of the improvement process. The necessary funds must be allocated for the required changes. All the efforts of a team will be wasted if their recommendations for improvement go unfunded.

Commitment must also come from every employee in the organization. Each employee must be dedicated to quality and improvement. They must take the time to identify their customers and find out what the customer wants and needs. They must then work to meet these needs.

Training. Training is a key ingredient to improvement. People must be provided with the knowledge necessary to complete their job, work together, analyze problems, and develop and choose solutions. This knowledge comes from training.

All members of the organization must receive awareness training. This should include, as a minimum, the mission of the organization, what TQM is and what it will do for the organization, and how TQM is being used in the organization.

Additional training should be provided in group dynamics, how to be a leader and a follower, use of the PDCA cycle, and statistical process control. Employees must receive this training to allow them to work towards continuous improvement.

Observations. Additional observations have been made dealing with the general approach to and genreal state of TQM in the DOD. These observations deal with the need for the sharing of information between organizations, the need to develop some type of DOD organization to act as a focal point and bring people together, and a question of how many organizations are truly committed to TQM and how many are simply going through the motions.

Sharing of information between organizations.
There is a definite need for a greater sharing of
information between organizations. There is very little
exchange of information and ideas between organizations in
the same and different services. The result is the
repeating of mistakes that could be prevented. Lessons
learned in TQM must be documented and shared so mistakes can
be avoided not repeated. The best source of lessons learned
found during this research is Mary Walton's book, a non DOD
publication, that identified lessons learned by NADEP Cherry
Point. There should be a better forum available for the
sharing of information other than an outside publication.

It also became apparent that there is a need to work
together to share training. Training courses such as SPC
include the same material and the same concepts regardless
of the organization conducting the training. However, each
organization is developing its own classes without checking
with other organizations to see if the class has already
been developed. An extremely absurd case of this was found
when one organization identified two separate departments
located on the same base developing the same training
classes for the separate departments. This results in a
massive waste of time and money. Departments and
organizations must work together to make things as simple as
possible.

DOD TQM focal point. There is a need for an
organization to work as a focal point in dealing with the

information and training issues just described. The

creation of such an organization would provide a place to

look for information on other TQM programs, points of

contacts for the various organizations, and would act as a

centralized training group.

This organization could conduct "train-the-trainer"

classes and be responsible for developing and updating the

training material to be used. This would reduce the number

of places now working on developing classes.

The DOD TQM focal point could be either an existing or

new organization. One existing organization that would be a

possible candidate for such a role is the Navy Personnel

Research and Development Center (NPRDC). They have been

involved in TQM since the mid 1980s and have done

considerable research and publishing in the area.

Additionally, they have worked with not only the Navy but

also the Army and Air Force.

Another potential candidate would be the Air Force

Institute of Technology (AFIT) School of Systems and

Logistics. They have a staff experienced in TQM that

currently work as consultants to the Air Force and Defense

Logistics Agency.

Total commitment? Throughout the course of this

study a wide range of commitment to TQM was observed. Many

organizations were very eager to discuss all aspects of

their program and provide any information they had

available. However, many organizations were very reluctant

to discuss the details of their program, and were not willing to send out any documentation.

The lack of willingness to participate forces one to question the sincerity of an organizations commitment. The underlying philosophy of TQM calls for continuous improvement. Participation in a study of this kind provides a forum for self evaluation, which will help on the road to continuous improvement.

One encounter that occurred during this research showed the lack of knowledge about TQM found in one particular organization. The person who answered the phone stated the person the call was intended for, the TQM focal point for the organization, was not in. When the person who answered the phone was asked if they could answer some basic questions on their TQM program they indicated they did not know what TQM was or if they had a program. A return call was made to the TQM focal point. This person indicated they did have a program, but had no apparent knowledge about what it entailed. This definitely indicates that there "program" is simply there to say they have one, not to change the organization.

Some organizations contacted indicated that they have TQM programs only because they have to. They stated the commander does not believe in TQM, but must show support to preserve promotion opportunities

These experiences underscore the need for commitment to TQM from the highest levels of the DOD. This commitment

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must be of the type explained in this study, that is, time and money. There is a great deal of education still needed for people to understand that TQM is not just a program, but a new way of business. Before TQM can become a way of life in the DOD attitudes of this type must change.

This is not to say there are no successful TQM programs underway. Many organizations are truly committed to TQM and to continuous improvement. These organizations have sincere top level commitment. They are training their people and providing them with the tools necessary to change.

It will take time for an entity as large as the DOD composed of so many unique and diverse people to completely change. Along with time is the need for training to open the eyes of the people who believe it is just another program. Although it is a large task, it is one that must be accomplished to ensure the DOD can survive the difficult times ahead. The recommendations provided in this study will provide a means for an organization to move towards continuous improvement.

Recommendations for the 14 points

During the course of discussion with so many organizations committed to both TQM and the Deming management method, and after the review of extensive literature on the subject, insight into the 14 points and how they can be lived in the DOD has been obtained. This information has been pulled together and is presented below

under the heading of each of the 14 points. The purpose of
this information is to assist managers committed to TQM to
obtain ideas and concepts for their organization. It should
be noted that many ideas and techniques flow over between
points, and are presented in more than one place.

Another key point to remember is that there is no
cookbook approach to TQM. Each organization must analyze
itself and determine what will and will not work in their
environment. The techniques below are merely that,
techniques. They may not all fit into any given
organization. They are presented as concepts to aid on the
road to continuous improvement and world class quality.

Finally, these techniques are only briefly presented
below. Many of the topics, such as statistical process
control and customer surveys, fill entire textbooks and have
courses dedicated to them. Managers must seek out experts
in the areas they believe are applicable to their
organization to obtain advice and training.

Point One: Create constancy of purpose for the
improvement of product and service (54:55).

Deming Seminar. The first step to creating a
constancy of purpose is the training of top management in
the Deming philosophy. Top management must understand, be
fully committed to, and willing to go the distance to make
quality and the Deming management method successful. The
Deming Seminar will provide in-depth training and knowledge

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of what the Deming management method is and what the responsibilities of management and employees are.

Additionally, a "critical mass" of managers and supervisors should attend the Deming Seminar. These people must represent all levels of the organization to ensure there is an understanding of the new philosophy throughout, not just at the top. They will be able to help spread the word and answer questions.

The Deming seminar is regularly attended by DOD personnel. The Foreign Technology Division (FTD) of the Air Force Systems Command has sent all members of its Executive Steering Committee (ESC) to the seminar. If a person should leave the ESC then the replacement is sent to the seminar (50). Naval Aviation Depot (NADEP) Jacksonville is another organization sending their senior management to the Deming seminar (42). NADEP Cherry Point has done the most towards creating a "critical mass" of managers and supervisors. They have sent over 200 people to the Deming seminar (4).

Mission statement. After management has had time to absorb the information obtained in the Deming Seminar, they should develop a mission statement. The mission statement should address the following issues:

    What is our aim?
    Who are our customers?
    What do we want to become?
    How are we going to get there?
    What are the barriers?
    How will we know we are making progress?
    What are our principle processes?
    Which are most in need of improvement? (53:235-236)

The mission statement must emphasize your long term goals to provide the best product and continuously improve. All members of the organization must be briefed on the mission and its importance to the organization. Having the commander brief and explain the new mission statement is a good way to begin showing top level commitment.

Well thought-out and well written mission statements are found in the DOD. The mission statements of NADEP Jacksonville and FTD state the goals of the organizations and acknowledge their emphasis on TQM. They identify their commitment to providing quality products and services, treating their people with respect, focusing on the wants and needs of the customer, and continuously improving (the mission statements are presented in their entirety in Chapter 4).

Customer surveys. The organization must identify who its customers are and what the customers expect, both internally and externally. This can be done through customer surveys. The survey should identify what the customer perceives to be important and determine how the organization is satisfying these expectations.

SM-ALC/TID is making extensive use of customer surveys to identify the wants and needs of both internal and external customers, and to see how they are meeting those needs. The surveys are being prepared and the results analyzed as part of a training class for supervisors. This ensures all departments are using surveys. Additionally, it

provides knowledgeable personnel to aid in survey preparation and interpretation (28).

FTD is using customer surveys to ensure they know what the customer wants. They also follow-up surveys with a visit to the customer's facility as needed (50).

Part of the culture. The new philosophy must become part of the culture of the organization. It must become a part of all aspects of every day business to ensure the change is permanent. The ongoing use of process action teams, quality management boards, and the like are necessary to remain focused on the need to improve. The organization must constantly evaluate processes and the way business is conducted to ensure there is continuous improvement. Customer surveys and employee surveys must be regularly conducted to identify where the strengths and weaknesses of the organization lie, and where they need to improve.

Making the new philosophy part of the culture is a combination of many things, including training and commitment. FTD has received commitment from their senior leaders, and training is now being developed (50). They are on their way to making TQM a part of the culture.

Employee surveys. Employee surveys should be conducted to determine how they view their job, the organization, and the way they are treated. This will identify the needs of the employees that must be addressed. The organization must strive to provide an excellent work environment for the people. Employee surveys should be

conducted on a regular basis to determine if the organization is improving, and if any new problem areas develop.

SM-ALC/TID is having employee surveys conducted annually be the Rand Corporation as part of Pacer Share. The survey takes an in-depth look at the attitudes and thoughts of the personnel. These results can be used to plan future actions (28).

FTD is another organization making excellent use of employee surveys. They have analyzed survey results and are taking actions to change the things that were identified as problems (51).

Attrition. Another way of demonstrating constancy of purpose is using attrition to deal with the need to downsize the organization, instead of layoffs. This demonstrates to employees a commitment to them and their well being. It shows the organization believes in its people and will stand behind them. This creates an environment of trust and builds moral.

FTD used attrition to achieve the necessary force reductions mandated by the Defense Management Review Board. There was no need to resort to layoffs to comply with new personnel requirements (51).

Point Two: Adopt the new philosophy (54:58).

Deming Seminar. Sending top executives and a critical mass of managers and supervisors to the Deming Seminar is a step in adopting the new philosophy. Training

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these people in the Deming management method to ensure they know what is required of them is critical. These people must understand and believe in quality for the effort to succeed.

The Deming seminar is regularly attended by DOD personnel. FTD has sent all members of its Executive Steering Committee (ESC) to the seminar. If a person should leave the ESC then the replacement is sent to the seminar (50). NADEP Jacksonville is another organization sending their senior management to the Deming seminar (42). NADEP Cherry Point has done the most towards creating a "critical mass" of managers and supervisors. They have sent over 200 people to the Deming seminar (4).

Customer surveys. The customer must become the focus of the organization. It is critical that the needs and expectations of the customer be identified with customer surveys. The information obtained must be transmitted to all employees. Everyone must know and understand the customer in order to provide a satisfactory, quality product.

SM-ALC/TID is making extensive use of customer surveys to identify the wants and needs of both internal and external customers, and to see how they are meeting those needs. The surveys are being prepared and the results analyzed as part of a training class for supervisors. This ensures all departments are using surveys. Additionally, it

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provides knowledgeable personnel to aid in survey preparation and interpretation (28).

FTD is using customer surveys to ensure they know what the customer wants. They also follow-up surveys with a visit to the customers facility as needed (51).

Customer visits. Visits must be made to the customers facilities, and the customers must visit the organization. This will provide additional insight into the needs of the customers while showing a commitment to satisfy the customer. Having the customer visit the organization provides them an appreciation of the work and effort that goes into developing a product. This will help improve the working relationship, allowing the customer to freely discuss the process that produces the product they buy.

FTD now visits customers to discuss the product being provided and the expectations of the customer. Additionally, they are sponsoring seminars where the customer visits FTD to discuss needs and requirements (50).

Incorporate the Deming philosophy into training. The Deming management method must become a part of training at all levels. The need to constantly improve and provide a quality product must be a fundamental part of all training, be it new employee orientation, statistical process control, or a course dealing with a specific job in a process.

NADEP Jacksonville has developed a course in the Deming philosophy that all employees attend. Additionally, all

employees receive training in statistical process control
(42).

Walk-the-talk. Top leaders, managers,
supervisors, and employees must walk-the-talk. They must
make quality a part of their daily work. This should be
seen at all levels. Senior leaders must show their
commitment in the work they do. They should communicate
with employees, be sensitive to their needs, and provide
them the opportunity to excel. The new philosophy must
become a way of life, not just another program that will
soon fade away.

This can be seen at NAVSUP Pearl Harbor. The Commander
there is personally interviewing all supervisors in the
organization. He is taking this time to learn more about
what is happening in the organization, what they are doing
in TQM, and to find out where help is needed. Allotting so
much time to these interviews shows his commitment to
improving. Additionally, they have a quality hour one day
each week. This hour is dedicated to TQM training, group
discussions, or visiting internal customers. This is done
to ensure all employees focus on quality (46).

Point Three: Cease dependence on mass inspection
(54:61).

Statistical process control (SPC). Quality must
no longer be inspected into a product, it must be built into
the product. To do this, the process that generates the
product must be in statistical control. SPC must be used to

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monitor the process and detect any changes that may hinder quality. Variations in the process can be quickly corrected and problems avoided.

To make SPC possible there must be training of employees at all levels. Everyone throughout the organization must understand what information is being obtained and how it is being used. SPC should not threaten anybody in the organization. Its benefits must be understood and accepted.

NADEP Alamdeda places heavy emphasis on SPC. They are currently using SPC, particularly control charts, to monitor as many processes as they can. They use control charts in manufacturing areas as well as on cost of work performed and cycle time. They use the control charts to determine when there is a change in the process that requires management attention (17).

Artisan certification. Artisan certification is another method that can be used to reduce dependence on mass inspection and build quality in. Artisan certification requires ensuring the artisans have the proper training and necessary skills to correctly do their job. They must then be allowed to perform with periodic review of their work by their fellow craftsmen, not by a separate quality control function.

Artisans must be given ongoing training to ensure they are capable of dealing with any changes in technology or the process. Additionally, the artisans should be trained in SPC

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to allow them to monitor the process they are responsible for.

At NADEP Jacksonville certified artisans are responsible for periodic checks of the work of fellow employees. The shop producing the product is now responsible for quality. The quality assurance function has been removed from all processes except those for flight critical items (41).

Work with suppliers. Working with suppliers is necessary to ensure the raw material or subcomponents coming in the door are of acceptable, consistent quality. If the components going into an assembly are not of high quality and reliable the end product will be not be high quality, and it too will be unreliable. A whole is only as good as its parts.

Suppliers must be encouraged to adopt the new philosophy and strive for high quality and continuous improvement. Long term relationships should be entered into with reliable suppliers. This will benefit both parties. The supplier will have the security to invest in their product knowing there is an ongoing market for it. The organization will benefit knowing it has a responsible, quality supplier it can count on.

NADEP Cherry Point is currently working with their suppliers. They have developed a briefing on their TQM program and goals that they present to their suppliers. Part of their presentation includes a plan to work together

to assure quality. They have met with McDonnell Douglas, Corp., one of their primary suppliers, to develop a long term program to create an atmosphere of mutual trust and respect (4).

Point Four: End the practice of awarding business on price tag alone (54:62).

Source selection. Source selection is a method of awarding a contract on a basis that includes not only cost but other factors as well. The contract is awarded based on the demonstrated ability of the contractor to provide a quality product as well as low price. This is done by developing a point system for contract evaluation that weighs cost as well as quality. Potential contractors are required to present their quality program and track record, their cost, and any other information deemed relevant by the government. An evaluator then assigns points to each item. The contract is awarded to the contractor with the highest score. Source selection is currently used by the mechanized materials handling division of the Air Force Logistics Command (AFLC/LGSH) for selected projects.

Blue ribbon contracting. Blue ribbon contracting is another method used by AFLC/LGSH. In blue ribbon contracting engineers evaluate the work of contractors on a variety of criterion that include quality and timeliness in performing a contract. Points are awarded for each of the criterion. At the conclusion of each contract the total points are tallied. Any contractor that receives a score of

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75 percent or better for two consecutive contracts is then eligible for a blue ribbon.

A blue ribbon entitles the contractor to special consideration in future contract competitions. They are allowed a 10 percent allowance over the price of the low bidder. This means that, at the governments discretion, a contract can be awarded to a blue ribbon contractor who is not the low bidder, but is within 10 percent of the low bidder. This provides an incentive for the contractor to perform at acceptable levels to achieve blue ribbon status. It also allows the government to award a contract to a contractor that has a history of high quality service (18).

Extended service agreements. Awarding service contracts for five years, as now being done by FTD, shows a commitment to a contractor. By allowing them to know their job is not short term they know that investments in the process can pay off. It also provides the contractor ample time to learn what the organization needs, so the contractor has an opportunity to provide a quality product. The long term agreement helps to build confidence and trust between the two parties.

Point Five: Improve constantly and forever the system of production and service (54:66).

Customer surveys. Customer surveys must be used on an ongoing basis to identify changes in organizational strengths and weaknesses over time. Changes in processes should be reflected in the survey results. The surveys will

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identify changes in customer attitudes and needs that the organization must adopt to. Additionally, they will indicate where the strengths of an organization lie.

SM-ALC/TID is making extensive use of customer surveys to identify the wants and needs of both internal and external customers, and to see how they are meeting those needs. The surveys are being prepared and the results analyzed as part of a training class for supervisors. This ensures all departments are using surveys. Additionally, it provides knowledgeable personnel to aid in survey preparation and interpretation (28).

FTD is using customer surveys to ensure they know what the customer wants. They also follow-up surveys with a visit to the customers facility as needed (50).

PDCA cycle. The key to continuous improvement is the ongoing use of the Plan-Do-Check-Act (PDCA) Cycle. This cycle must be used to analyze processes and determine where and how improvements can be made. The PDCA cycle is an ongoing process, it is not followed one time then forgotten. It must be continuously followed.

This cycle consist of 4 steps that will lead to continuous improvement.

> Step 1: The first step is to study a process, to decide what change might improve it. Organize the appropriate team. Perhaps people from purchasing, or the supplier, or the product engineer. What data are necessary? Does the data already exist, or is it necessary to carry out a change and observe it? Are tests necessary? Do not proceed without a plan. (54:86)

Step 2: Carry out the tests, or make a change, preferably on a small scale. (54:86)

Step 3: Observe the effects. (54:87)

Step 4: What did we learn? Repeat the test if necessary, perhaps in a different environment. Look for side effects. (54:87)

The use of this cycle "will lead to continual improvement of methods and procedures (54:88)." It can be applied to any process.

The PDCA cycle makes use of many of the statistical process control tools. Included in these are pareto charts, histograms, scatter diagrams, run charts, and control charts.

The PDCA cycle is being used extensively in the DOD. FTD teaches it to every new employee as part of awareness training. Process action teams at FTD and NADEP Jax use the PDCA cycle to investigate and improve processes (50) (42).

Point Six: Institute training and retraining.

Training plans. Every job in an organization must have a thoroughly researched training plan. The training plan must include all courses necessary to provide an employee with the skills needed to accomplish the task they are responsible for. The training must emphasize quality. Upon completion of training the employee should not only know how to complete a job, but should also know how to tell if it was done right. Acceptable and unacceptable performance must be clearly defined and shown to all

employees. There should be no doubt in an employee's mind as to what their job is and how it should be done.

FTD has commissioned a PAT to determine the training needs of the administrative career field. The PAT is tasked with reviewing what skills are needed to perform the job, and what training is required to provide those skills. A training plan will then be developed. FTD plans to continue this process for all career fields they employ (50).

Refresher training. Employees should attend refresher courses on a periodic basis to reenforce their previous training. The refresher course should review critical performance areas and provide a forum for discussion of potential improvements. NADEP Jax has developed and now conducts refresher training for each of their skilled positions (41).

Certification. Employees must be certified in their skills. Upon completion of all training the employee must demonstrate their ability to correctly complete the task to both the course instructor and the supervisor. When the employee can proficiently perform the task then the employee, the trainer, and the supervisor must sign the training form indicating the person does indeed poses the skill.

NADEP Jax is currently employing an artisan certification program. Once an artisan is certified they are responsible for their own work. An occasional inspection is done by another certified artisan (41).

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SM-ALC/TID is currently using job proficiency guides (JPGs) to document the skills of employees. Upon completion of training the trainer, employee, and employee's supervisor must sign the JPG verifying that the employee has indeed learned the task being taught (28).

Follow-up surveys. Follow-up surveys should be conducted to determine the effectiveness of training. By testing employees 1 to 3 months after completion of training it is possible to determine how well they actually understood the material taught. This will help to gauge the knowledge of the workforce, determine the effectiveness of the training, and identify areas where the training is lacking.

NADEP Jax uses post training surveys as a tool to test for retention and usefulness. Changes are then made to the courses based on survey results (41).

Expert systems. Expert systems can be used to serve both as a training aid and as a reference point. An expert system can be built to include all requirements of a job. Putting this information in an easily accessible, user friendly, system will ensure the employee can find the answers they need when they need them. The same system can be used as a training instrument to provide solutions to tough questions that are not frequently encountered. FTD now uses an expert system to aid employees in problem solving. If the system can not help it recommends another FTD employee that may be able to (50).

<u>Point Seven: Institute leadership (54:70)</u>.

Instituting leadership is not an easy task.   There are no simple answers to transforming supervisors/managers into leaders.   However, there are things that can aid in this process.

<u>Training</u>.   Managers and supervisors must receive training in what it means to be a leader, their obligations as a leader, and methods for leading.   Leaders must know what the people that work for them must do to perform the job.   The leader must understand the process and be able to assist employees when a problems arises.   The leader must learn to act as a coach and teacher, not simply somebody counting units produced (31:4-6).

For these changes to occur the supervisors and managers must be trained in teambuilding and employee relations. They must also be trained in the process to ensure they understand it fully, allowing them to provide the leadership employees need (31:4-6).

NADEP Jax is an organization that is providing extensive training to managers and supervisors to help them be leaders.   The training includes methods of giving direct, specific, and non-punishing feedback to employees about their work (41).

<u>Selection</u>.   Selection of the proper personnel to be managers and supervisors is an important part of instituting leadership.   The person selected must understand the process.   They must also understand their role as a

leader. The proper selection of leaders by management is critical in ensuring the long term success of the organization (31:4-6).

Stop managing by numbers. Supervisors and managers must be trained to evaluate personnel on criteria other than output. The number of units produced must not be the sole indicator of a persons success or failure at a task. Managers and supervisors must base feedback on the quality of work performed as well as an employees efforts to be a team player working to improve the process.

In an effort to stop managing by numbers NADEP Jax has removed time standards from the employee appraisal system (41). The time standards are now used for price and schedule estimates only (41).

Point Eight: Drive out fear (54:72). Driving out fear is not easily done. It is something that requires change in the organization. Employees must feel they are able to speak openly and freely without fear of reprisal.

Training. Training is one step in driving out fear. Supervisors must become leaders. The employee must believe they can approach their supervisor and freely discuss problems without negative results. The supervisor must be able to openly communicate with the employees and work together.

All employees should be trained in communication and team work. This will help them to be able to better communicate and feel more confident in themselves. Being

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trained in team concepts allows them to see the benefits of working together, and realize that they must bring up their ideas to improve the process for all.

Training as a method of driving out fear is being used by many DOD organizations. As mentioned above, NADEP Jax is providing training to supervisors and managers to help them become better leaders (41). NADEP Cherry Point is providing group dynamics training to help groups work together and be able to handle problems and conflicts that may arise (4).

Stop managing by numbers. Management by numbers must stop. If an employee is judged on how much output they produce they will not stop working to identify quality problems that arise. The employee knows that the time they spend trying to improve the process and quality of the product will lower their output and act as a mark against them. Changing the way employees are rated is a step towards alleviating this problem.

In an effort to stop managing by numbers NADEP Jax has removed time standards from the employee appraisal system (41). The time standards are now used for price and schedule estimates only.

Suggestion programs. Suggestion programs should be initiated. This can be done anonymously in the beginning until fear is driven out. This will provide an avenue for communicating problems to upper management that require attention. Suggestion programs can be run on bulletin boards or local area networks. Which ever method is chosen

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the suggestions and actions taken should be made available to the entire organization. Allowing people to see the results and see management is serious about change is an effective way of driving out fear.

FTD has an excellent suggestion program. Their program takes advantage of their local area network (LAN). An employee logged on to the LAN can access TQMNET. This allows them the option of entering the suggestion program. Ideas can be sent directly to members of the executive steering committee, or any one else in the organization. Copies of the comments are made available to all who access TQMNET. Replies are sent back over the LAN as quickly as possible. If there is more than a one week delay for a reply then a status update is sent. Bulletin boards are also used for individuals without access to the LAN (50).

Workforce visits. Management should make themselves available to employees at all times, however they should begin a program of work force visits. In this program the senior and upper level leaders would take one day each month to work in a process. This would allow them to see first hand what is happening at the working level and allow them to experience the problems of the people. It also provides a good forum for employees to openly discuss issues with the senior leaders in a non-threatening environment. Work force visits of this type are currently being used by NADEP Jax (41).

Walk-the-talk. Management at all levels must begin to show their commitment to the program. Their actions and words must indicate that there will not be retribution for attempting to improve the process and increase quality. Employees must be able to see that management is committed to improving and ready to work together.

This can be seen at NAVSUP Pearl Harbor. The Commander there is personally interviewing all supervisors in the organization. He is taking this time to learn more about what is happening in the organization, what they are doing in TQM, and to find out where help is needed. Allotting so much time to these interviews shows his commitment to improving. Additionally, they have a quality hour one day each week. This hour is dedicated to TQM training, group discussions, or visiting internal customers. This is done to ensure all employees focus on quality (46).

Attrition. Management must be committed to the use of attrition to reduce the workforce during down turns in business. Employees must know that their job is secure and will not fall victim to the business cycle. Knowing this allows people to devote their energy to doing a good job, not to worrying about a possible layoff.

FTD used attrition to achieve the necessary force reductions mandated by the Defense Management Review Board. There was no need to resort to layoffs to comply with new personnel requirements (51).

Point Nine: Break down barriers between staff areas (54:74).

Teams. The development of teams that cross functional areas is a good way to break down barriers between staff areas. Following the Navy Personnel Research and Development Center (NPRDC) model of an executive steering committee (ESC), quality management boards (QMBs), and process action teams (PATs) is good place to start. Using these teams with cross functional area members brings people to work together that normally work in isolation. This allows them to sit down and communicate, realizing that every body is working toward the quality and continuous improvement.

This study showed the use of teams throughout the organizations contacted. NADEP Cherry Point has an Executive Steering Committee (ESC), Department Head Quality Management Board, Quality Management Boards (QMBs), and Process Action Teams (PATs) (4). NADEP Jax uses an ESC, Strategic QMB, QMBs, and PATs (42). FTD uses a slightly different team structure. They have an ESC, Quality and Productivity Improvement Teams, Process Improvement Teams, and Process Action Teams (50). All these organizations use their teams as an aid to process improvement. Where applicable, cross functional area teams are used.

Updates. Keep all members of the organization updated on what is happening in all work units as well as the organization as a whole. Publishing a bi-weekly or

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monthly paper or using a local area network (LAN) to
disseminate information is important in breaking down
barriers. A variety of information must be transmitted to
help employees know their fellow workers and know what is
being done to improve the organization.

Employees must know what is taking place throughout the
organization. They must know what long term plans are being
made, and what outside variables are affecting the short
term. Having the Commander as a regular contributor to the
paper/LAN will show his ongoing support as well as keep
employees informed on the latest changes in plans.

The paper/LAN can be used to publish information about
promotions, career milestones, and personnel events,
providing a human quality to people who may be in another
department. This will help employees learn more about
and become familiar with their fellow workers. This will
help to break down barriers that may have been built between
nameless coworkers.

The paper/LAN should also be used to publish success
stories. It will help boost the morale of the workforce to
see that everybody is working together towards continuous
improvement.

SM-ALC/TID publishes the Pacer Share Update on a bi-
weekly basis. This news letter contains notes from the
commander, information on achievements within the
directorate, news of interest ... the workforce, and training

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information (28). It provides a good forum for sharing and disseminating information.

FTD takes advantage of their LAN for spreading information. It is used to publish suggestions as described above as well as notes from the commander, training information, and news of interest to the workforce (50).

Surveys. Internal surveys can also be used to break down barriers between departments. By knowing who your internal customer is and what their wants and needs are you can better understand them and work with them. Knowing your customer will foster a better working relationship with them.

SM-ALC/TID is making extensive use of customer surveys to identify the wants and needs of internal customers, and to see how they are meeting those needs. The surveys are being prepared and the results analyzed as part of a training class for supervisors. This ensures all departments are using surveys. Additionally, it provides knowledgeable personnel to aid in survey preparation and interpretation (28).

Point Ten: Eliminate slogans, exhortations, and targets for the workforce (54:76).

Common sense. The best way to eliminate meaningless slogans and exhortations is to apply common sense to them. Management must think about what the slogan is saying and what it means before plastering it to all the walls. Management should not "motivate" the workforce with

slogans telling them to "Do it right the first time." This implies that they should be doing it right the first time and if not it is their fault. The slogan does not give the worker credit for trying and will only discourage them.

Eliminate arbitrary targets. Management should not declare that productivity will increase 10 percent and defects will decrease 15 percent. This is often done with no means to achieve the change, just some words stating things will improve. Management must provide tools to improve, either new techniques, new technology, or additional training. When this is provided there still should not be any unfounded claims about the new changes that will take place. The workers should be provided the tools and allowed to improve naturally, not with the pressure of a new target.

Training. The types of slogans that fit into this category should be explained to the workforce in their initial training on the new philosophy. All employees should be told to point out any meaningless slogans, exhortations, or targets to management. Anybody who identifies one should be rewarded by having their accomplishment noted in the paper/LAN. This will also serve as an indicator to other employees that management is committed to change, and willing to identify past mistakes.

Training is being used by FTD and NADEP Jax to teach employees about meaningless slogans and their effects. All

employees attend these classes to attempt to ensure all employees can identify any meaningless slogans (51) (41).

Point Eleven: Eliminate numerical quotas (54:78).

Performance measures. Success or failure for a days, weeks, months, or years work must no longer be measured in units produced or percent of dollars obligated. Management must put success or failure in terms of quality improvements, customer satisfaction, and the ability to provide a product that will ensure the long term survival of the organization. The focus must be on continuous improvement of both product and the organization. The organizations contacted did not address how they were changing their performance measures to focus on these items.

Employee ratings. Management must stop rating employees against numerical quotas. The basis for performance evaluation should be the quality of the employees work as well as their contribution to continuous improvement and their willingness to be a team player.

NADEP Jax is an organization who has adopted this concept. They have removed time standards from the employee appraisal system (41). The time standards are now used for price and schedule estimates only.

Routing/sequence slips. Management must remove predicted completion times from material routing/sequencing slips. When an employee sees these numbers they immediately think they must complete the part in the given time or face

adverse consequences. The emphasis is no longer on quality, it is on completing the part in a given amount of time.

Management must send routing/sequence slips with only the work to be done, not an artificially set completion time that may or may not be reasonable. This has been done by NADEP Jax (41).

Point Twelve: Remove barriers to pride of workmanship (54:81).

Employee surveys. Employees should be surveyed to determine what barriers to pride of workmanship they encounter. Management must then work to remove these barriers.

NADEP Jax had the Navy Personnel Research and Development Center conduct an employee survey that questioned employees on barriers to improvement. The results are used to identify weaknesses at NADEP Jax as well as areas in which improvements have been made (41).

Work area. Management must ensure the work area is properly lit, well ventilated, and designed with safety in mind. Work area problems can be identified in the employee survey. Management must invest money to correct any deficiencies and provide a work area that is not only safe but provides the worker with an environment that allows them to perform at their best. A worker in a poorly lit, poorly designed work area will have low morale, increased risk of injury, and difficulty consistently producing high quality parts.

SM-ALC/TID is placing heavy emphasis on the work environment in new buildings. A new warehouse, Building 788, was recently constructed at SM-ALC. The building included bright colors and plenty of lighting to ensure good visibility in the work area. A large break area with windows was included. The equipment used in the warehouse included all available safety features to minimize any potential for accidents. The extra features included in the warehouse cost more, but they greatly improve the work environment for the employees.

Accurate drawings/data. Management must ensure that the drawings and data provided to the manufacturing area are up to date and accurate. Controls must be in place that ensure the production shop is building the right part, not an obsolete model. Forcing personnel to redo a job because of management error will lower moral.

Quality materials. A good relationship must be developed with suppliers to ensure the materials coming into the shop are the quality required for the job. Contractors who routinely ship poor quality material must work to improve or no longer be able to do business with the government. A machinist can not turn defective raw material into a quality final product.

NADEP Cherry Point is currently working with their suppliers to improve the quality of incoming material. They have developed a briefing on their TQM program and goals that they present to their suppliers. Part of this

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presentation includes a plan to work together to assure quality. They have met with McDonnell Douglas, Corp., one of their primary suppliers, to develop a long term program to create an atmosphere of mutual trust and respect (4).

Available parts. The necessary parts and materials must be available to complete a job sent to a work center. The inventory system and scheduling system must work together to ensure that all jobs scheduled have the necessary material available.

Stop rush jobs. Crisis management must stop. Management must work to provide the necessary time to due the job right to craftsmen. Expecting a job to be done in 1 hour when it normally takes 2 hours forces the worker to cut corners, and produce a low quality part. Management must take responsibility for their mistakes and not expect workers to lower quality to cover for a management oversight.

Go the extra distance. There are times when employees must be allowed to perform extra work to make an improvement in a finished product. This may cost a little extra, but the improved product will make the employee and the customer happier and more satisfied.

NADEP Cherry Point allowed the C-130 rework process to go the extra distance. The C-130 receives extensive overhaul at Cherry Point. Must of the work is internal to the plane, and not visible without the removal of panels. During the overhaul extensive work is done inside the

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cockpit, but it was not cosmetic. This meant that the plane went out looking the same as it did when it came in.

Cherry Point determined that the cost to paint the interior of the cockpit was minor compared to the cost of the overhaul. Management now allows for painting of the cockpit to provide a much more aesthetically pleasing product. This makes the workers feel better about what they are doing since the improvements are now readily apparent. It also makes the customer feel better about the product (53:169-170).

Public relations. Accomplishments of employees should be recognized. This could be in a variety of ways, including a personal visit by the commander, a display case in the lobby, or a write-up in the base or local newspaper.

FTD uses their TQMNET to publish the success stories resulting from employees efforts as well as general information about their TQM program (50). SM-ALC/TID uses their bi-weekly paper, the Pacer Share Update, to present the success stories of their employees (28).

Point Thirteen: Institute a vigorous program of education and retraining (54:84).

Training plans. All employees must have a training plan. The training plan must include all classes/seminars necessary to complete their primary job as well as additional classes for career broadening. The additional classes can provide insight into areas such as the overall function of the organization, the budgeting

process, presentation techniques, and other areas that will help round the employees.

FTD has commissioned a PAT to determine the training needs of the administrative career field. The PAT is tasked with reviewing what skills are needed to perform the job, and what training is required to provide those skills. A training plan will then be developed. FTD plans to continue this process for all career fields they employ (50).

Advanced education. If possible a program should be worked out with local universities to provide classes at the organization during lunch times and after hours. These classes should cover a wide spectrum of areas and be available to all employees, at as reasonable a price as can be negotiated. Additionally, information on programs taught at local universities and schools should be made available to the workforce so they can attend if desired.

FTD is has an in-house Masters Degree program through the Defense Intelligence College available to its employees (51). SM-ALC/TID publishes information about classes available on base from local universities (28).

Expert systems. Expert systems should be used as a training device. They can be used as a part of some jobs where applicable. They can also be used to teach classes that are not available on base but are of interest to the employees. This would be applicable for courses such as the planning, programming, and budgeting system. The expert

system software could be made available to employees who are interested.

FTD now uses an expert system to aid employees in problem solving. If the system can not help it recommends another FTD employee that may be able to. Using the expert system presents information to employees they otherwise may not have been found (50). It exposes them to and allows them to learn about things they were not familiar with.

Follow-up surveys. Follow-up surveys should be conducted to determine the effectiveness of training. By testing employees 1 to 3 months after completion of training it is possible to determine how well they actually understood the material taught. This will help to gauge the knowledge of the workforce, determine the effectiveness of the training, and identify areas where the training is lacking.

NADEP Jax uses post training surveys as a tool to test for retention and usefulness. Changes are then made to the courses based on survey results (41).

Point Fourteen: Take action to accomplish the transformation (54:86).

Commitment. The top management of the organization must be fully committed to the new philosophy before permanent change can take place. Their commitment must be known and felt throughout the organization, motivating all employees to become committed.

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The top management, in particular the Commander, at FTD shows commitment to the new philosophy. Their Commander was the driving force behind the adoption of TQM. The Commander actively sends out messages and thoughts on TQM on FTDs TQMNET. Additionally, the Commander is a member of the Executive Steering Committee (50).

The Commander at NAVSUP Pearl Harbor is showing his commitment by interviewing all the supervisors. This is a process that takes a great deal of time. It is important because it shows the workforce the Commander considers TQM important enough to dedicate so much time to learning more about the process and the problems facing the organization (46).

Training. The entire organization from the top down must be trained in the Deming management method and the tools necessary to make it work. Training must be ongoing. Personnel should be trained in their job as well as TQM and statistical techniques.

Training is used extensively by the organizations contacted in this study. NADEP Cherry Point and Corpus Christie Army Depot have developed training matrices. The matrices identify what courses are available and who should take them. Priorities are identified to help determine who should take a particular course first. The classes available include the Deming management method and the tools necessary to make it successful (4) (35).

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Customer surveys. Customer surveys must be used extensively to identify both the internal and external customers and their needs. Once this is done then areas that require management attention will be identified.

SM-ALC/TID is making extensive use of customer surveys to identify the wants and needs of both internal and external customers, and to see how they are meeting those needs. The surveys are being prepared and the results analyzed as part of a training class for supervisors. This ensures all departments are using surveys. Additionally, it provides knowledgeable personnel to aid in survey preparation and interpretation (28).

FTD is using customer surveys to ensure they know what the customer wants. They also follow-up surveys with a visit to the customers facility as needed (50).

PDCA cycle. The Plan-Do-Check-Act Cycle must be used to attack weaknesses and problem areas in the organization. Use of the PDCA Cycle must be ongoing. Once a process improvement is in place, thought must begin on how next to improve the process.

The PDCA cycle is being used extensively in the DOD. FTD teaches it to every new employee as part of awareness training. Process action teams at FTD and NADEP Jax use the PDCA cycle to investigate and improve processes (51) (41).

Statistician. Highering a full time statistician is an important step in changing the organization. The person must have thorough knowledge of not only statistics,

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but also TQM and the Deming management method. This person must have the necessary power to use the tools they posses. Senior leaders must know and listen to this person and be open to the new way of thinking.

NADEP Jax has a statistician and statistical assistant on staff to aid in process improvement, providing both advice and training (41). FTD has developed an in-house statistical support group to provide training and assistance to employees (51).

Future Research Topics

In-depth case study of a Deming management method user. This was a very macro study. A future study should closely examine one or more of the organizations that are using the Deming management method in much greater detail. A detailed look at an organization's program would provide more insight to how things are being done and what results have been achieved.

The detailed case study would include surveys of members of the organization and the customers that receive their product. The surveys could tell if the organization is truly committed to continuous improvement and if the customers they serve can see the improvement.

Comparison of a hybrid organization and an organization using the Deming management method. Another area requiring further research is a comparison of an organization using a hybrid approach with an organization using the Deming

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management method.   This study would take a detailed look at both organizations and compare their similarities and differences and their strengths and weaknesses.

This study would include surveys of employees within the organization and the customers they serve.   The results would provide additional insight into the different approaches to TQM.

Appendix A: Step 2 Questionnaire

Point 1

1. Has your organization established/published/
disseminated its mission statement? What is it?

2. How do you know it was understood?

3. How do you know the mission will not change when
you get a new commander?

Point 2

4. How is the Deming philosophy part of your training?
Is it incorporated at all levels?

5. How do you identify your customers needs?

Point 3

6. Where do you rely on mass inspection to assure
quality?

7. What are you doing to eliminate it?

Point 4

8. What steps have you taken to stop awarding business
on the basis of price tag alone?

9. What have you done to develop single-sources of
supply?

Point 5

10. Where are you using the PDCA cycle?

Point 6

11. What have you done to ensure employee's are
properly trained in their job?

12. What systems that would hinder the effectiveness
of training have you changed for the better?

Point 7

13. What are your criterion for giving feedback?

14. What have you done to turn your supervisors into
leaders?

Point 8

    15.   What are you doing to reduce fear?

Point 9

    16.   How are you breaking down barriers between departments?

Point 10

    17.   What do your people consider meaningless slogans?

    18.   How do you know?

Point 11

    19. How do you measure a full days work in administrative areas?

    20. How are you eliminating work standards?

Point 12

    21.   Have you surveyed your organization to identify barriers to continuous improvement?

    22.   How are you eliminating these barriers?

Point

    23.   at training are you providing to your employees to prepare . em for the future?

    24.   How _ you measure the success of your training?

Point 14

    25.   What has been done to signify it is no longer business as usual?

    26.   To whom do you go for statistical advice?

    27.   What steps have you taken to transform your organization?

Appendix B: Organizations Contacted During the Research

Office of the Under Secretary of Defense for Acquisition

Federal Quality Institute

Air Force

Department of the Air Force, Productivity & Programs
Strategic Air Command
Electronic Security Command
Military Airlift Command
Tactical Air Command
HQ Air Force Reserves

HQ Air Force Logistics Command
San Antonio Air Logistics Center
Warner Robins Air Logistics Center
Sacramento Air Logistics Center
Ogden Air Logistics Center
Oklahoma City Air Logistics Center

HQ Air Force Systems Command
Electronic Systems Division
Aeronautical Systems Division
Space Systems Division
Human Systems Division
Flight Test Center
Foreign Technology Division
Arnold Engineering and Development Center
Developmental Test Center

Army

Office of the Chief of Staff, Army
HQ, Army Material Command

US Army Depot Systems Command, DCS for Strategic
Planning
Anniston Army Depot
Corpus Christie Army Depot
Letterkenny Army Depot
Lexington Army Depot
New Cumberland Army Depot
Red River Army Depot
Sacramento Army Depot
Seneca Army Depot
Sierra Army Depot
Tooele Army Depot
Tobyhanna Army Depot

Watervliet Arsenal

Rock Island Arsenal

Defense Logistics Agency

HQ Defense Logistics Agency
Defense Construction Supply Center
Defense Electronics Supply Center
Defense Industrial Supply Center
Defense General Supply Center
Defense Personnel Supply Center
Defense Fuel Supply Center

Defense Depot Mechanicsburg
Defense Depot Memphis
Defense Depot Columbus
Defense Depot Ogden
Defense Depot Tracy
Defense Depot Richmond

Navy

Naval Personnel Research Center

HQ Naval Air Systems Command
Naval Aviation Depot Alameda
Naval Aviation Depot Jacksonville
Naval Aviation Depot Cherry Point
Naval Aviation Depot Norfolk
Naval Aviation Depot Pennsacola
Naval Aviation Depot

HQ Naval Supply Command
Naval Supply Center Jacksonville
Naval Supply Center San Diego
Naval Supply Center Charleston
Naval Supply Center Pearl Harbor
Naval Supply Center Norfolk
Naval Supply Center Oakland
Naval Supply Center Puget Sound

Appendix C: Users of the Deming Management Method

Air Force

Sacramento Air Logistics Center, Directorate of Distribution
Foreign Technology Division, Air Force Systems Command

Army

Anniston Army Depot
Corpus Christie Army Depot
Letterkenney Army Depot
New Cumberland Army Depot
Red River Army Depot
Sacramento Army Depot

DLA

Defense Personnel Support Center
Defense Depot Mechanicsburg Pennsylvania

Navy

Headquarters, Naval Air Systems Command
Naval Aviation Depot Alameda
Naval Aviation Depot Jacksonville
Naval Aviation Depot Cherry Point
Naval Aviation Depot Norfolk
Naval Aviation Depot Pennsacola

Headquarters, Naval Supply Command
Naval Supply Center San Diego
Naval Supply Center Charleston
Naval Supply Center Pearl Harbor
Naval Supply Center Puget Sound

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Vita

Mr Shawn P. Lyman was born on 23 May 1962 in Columbus, Ohio. He graduated from Bishop Hartley High School in Columbus, Ohio in 1980 and attended the Ohio State University, graduating with a Bachelor of Science in Industrial Engineering in June 1985. Upon graduation he began working for the Mechanized Materials Handling Division of the Air Force Logistics Command, working with systems design, acquisition, and installation. He was accepted for long-term full-time training with the Logistics Civilian Career Enhancement Program (LCCEP), and entered the School of Systems and Logistics, Air Force Institute of Technology in May 1990.

Permanent Address: 137 Maplelawn Drive
Dayton, OH 45405

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13. ABSTRACT (Maximum 200 words)

This study looked for DOD logistics organizations using the Deming management method to implement TQM. A total of 21 organizations were identified that claim to be following Deming. These organizations were then questioned on what they are doing to implement the Deming philosophy. Each organization is presented and their program discussed. The techniques being used in the different TQM programs were then classified according to each of the 14 points.

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