# NAVAL POSTGRADUATE SCHOOL
## Monterey, California






# THESIS

A COMPARATIVE ANALYSIS OF
TOTAL QUALITY MANAGEMENT
AND COMPLIANCE INSPECTIONS
AS THE CONTROL MECHANISM FOR
THE COAST GUARD'S AFLOAT
CENTRALIZED SUPPLY SYSTEM

by

Vincent B. Atkins
and
Robert S. Thien

December 1992

Thesis Advisor: Susan Hocevar
Thesis Advisor: Gail Thomas





UNCLAS

SECURITY CLASSIFICATION OF THIS PAGE

# REPORT DOCUMENTATION PAGE

| | |
|---|---|
| 1a. REPORT SECURITY CLASSIFICATION<br>Unclassified | 1b. RESTRICTIVE MARKINGS |
| 2a. SECURITY CLASSIFICATION AUTHORITY | 3. DISTRIBUTION/AVAILABILITY OF REPORT<br>Approved for public release; distribution is unlimited. |
| 2b. DECLASSIFICATION/DOWNGRADING SCHEDULE | |
| 4. PERFORMING ORGANIZATION REPORT NUMBER(S) | 5. MONITORING ORGANIZATION REPORT NUMBER(S) |

| | | |
|---|---|---|
| 6a. NAME OF PERFORMING ORGANIZATION<br>Naval Postgraduate School | 6b. OFFICE SYMBOL<br>*(If applicable)*<br>AS/36 | 7a. NAME OF MONITORING ORGANIZATION<br>Naval Postgraduate School |
| 6c. ADDRESS *(City, State, and ZIP Code)*<br>Monterey, CA 93943-5000 | | 7b. ADDRESS *(City, State, and ZIP Code)*<br>Monterey, CA 93943-5000 |
| 8a. NAME OF FUNDING/SPONSORING ORGANIZATION | 8b. OFFICE SYMBOL<br>*(If applicable)* | 9. PROCUREMENT INSTRUMENT IDENTIFICATION NUMBER |
| 8c. ADDRESS *(City, State, and ZIP Code)* | | 10. SOURCE OF FUNDING NUMBERS<br>Program Element No / Project No / Task No / Work Unit Accession Number |

11. TITLE *(Include Security Classification)*

A COMPARATIVE ANALYSIS OF TOTAL QUALITY MANAGEMENT AND COMPLIANCE INSPECTIONS AS THE CONTROL MECHANISM FOR THE COAST GUARD"S AFLOAT CENTRALIZED SUPPLY SYSTEM (U)

12. PERSONAL AUTHOR(S) Atkins, Vincent B. and Thien, Robert S.

| 13a. TYPE OF REPORT | 13b. TIME COVERED | 14. DATE OF REPORT *(year, month, day)* | 15. PAGE COUNT |
|---|---|---|---|
| Master's Thesis | From To | 1992, December | 211 |

16. SUPPLEMENTARY NOTATION

The views expressed in this thesis are those of the author and do not reflect the official policy or position of the Department of Defense or the U.S. Government.

| 17. COSATI CODES | | | 18. SUBJECT TERMS *(continue on reverse if necessary and identify by block number)* |
|---|---|---|---|
| FIELD | GROUP | SUBGROUP | Control Systems, Inspections, TQM,Parallel Learning Structures,Coast Guard, |
| | | | |
| | | | |

19. ABSTRACT *(continue on reverse if necessary and identify by block number)*

This thesis examines the Coast Guard's current compliance-oriented inspections and considers Total Quality Management (TQM) as an alternative control mechanism aboard the Coast Guard's High Endurance Cutters. This comparative analysis is based on a review of applicable literature and data gained through field interviews.

The Coast Guard's use of an overlay structure to increase innovation is analyzed. Research on parallel learning structures suggests that questions remain about the impact such structures may have on transforming Coast Guard culture.

A comparative analysis is used to weigh the merits of compliance systems and the self-control mechanisms of the Quality Advantage, the Coast Guard variant of TQM. A basic model of the control serves as a framework for comparison. Significant differences in philosophy, control processes and results are noted. The major goals of organizational efficiency and innovativeness are impacted differently by the two systems.

| 20. DISTRIBUTION/AVAILABILITY OF ABSTRACT | 21. ABSTRACT SECURITY CLASSIFICATION | |
|---|---|---|
| ☒ UNCLASSIFIED/UNLIMITED ☐ SAME AS REPORT ☐ DTIC USERS | | |
| 22a. NAME OF RESPONSIBLE INDIVIDUAL<br>Gail Fann Thomas | 22b. TELEPHONE *(Include Area code)*<br>408-646-2756 | 22c. OFFICE SYMBOL<br>AS/FA |

**DD FORM 1473, 84 MAR** 83 APR edition may be used until exhausted. All other editions are obsolete

SECURITY CLASSIFICATION OF THIS PAGE

UNCLAS

Approved for public release; distribution is unlimited.

A Comparative Analysis of Total Quality Management and Compliance Inspections as the Control Mechanism for the Coast Guard's Afloat Centralized Supply System

by

Vincent B. Atkins
Lieutenant, United States Coast Guard
B.S., United States Coast Guard Academy, 1982

and

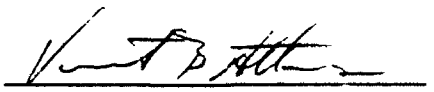
Robert S. Thien
Captain, United States Marine Corps
B.S., Rochester Institute of Technology, 1985

Submitted in partial fulfillment
of the requirements for the degree of

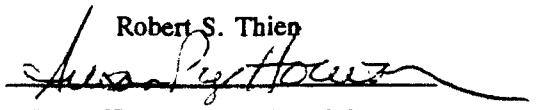
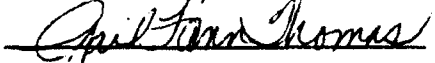
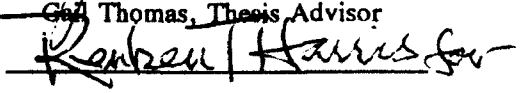
MASTER OF SCIENCE IN MANAGEMENT

from the

NAVAL POSTGRADUATE SCHOOL
December 1992

Authors: 
Vincent B. Atkins

Robert S. Thien

Approved by: 
Susan Hocevar, Thesis Advisor

Gail Thomas, Thesis Advisor

David Whipple, Chairman, Administrative Sciences

## ABSTRACT

This thesis examines the Coast Guard's current compliance-oriented inspections and considers Total Quality Management (TQM) as an alternative control mechanism aboard the Coast Guard's High Endurance Cutters. This comparative analysis is based on a review of applicable literature and data gained through field interviews.

The Coast Guard's use of an overlay structure to increase innovation is analyzed. Research on parallel learning structures suggests that questions remain about the impact such structures may have on transforming Coast Guard culture.

A comparative analysis is used to weigh the merits of compliance systems and the self-control mechanisms of The Quality Advantage, the Coast Guard variant of TQM. A basic model of control serves as a framework for comparison. Significant differences in philosophy, control processes and results are noted. The major goals of organizational efficiency and innovativeness are impacted differently by the two systems.

TABLE OF CONTENTS

# I. INTRODUCTION

## A. PURPOSE

Recent changes in Coast Guard logistics and management practices suggest a reassessment of the Coast Guard's control mechanisms. These changes include the implementation of a centralized logistics program at the unit level and a Coast Guard-wide turn towards Total Quality Management.

This thesis examines the Coast Guard's current compliance-oriented inspections and considers Total Quality Management (TQM) as an alternative control mechanism aboard the Coast Guard's High Endurance Cutters.

## B. BACKGROUND

In the mid-1980s, the Coast Guard implemented a centralized supply system (CSS) aboard its High Endurance Cutters[1] with a view towards improving logistical support. CSS would, in part, respond to growing concerns of poor shipboard inventory management and other logistical inefficiencies. Historically, the Coast Guard has depended on compliance inspections to ensure that its units were following supply policies and procedures. The present standard compliance checklists, however, do not reflect CSS changes.

---

[1]The Coast Guard's larger ships are known as High Endurance Cutters (HECs) and as 378s, a reference to their length.

As a result, the 378s' new supply management practices have gone uninspected since their implementation in 1988.

In 1990, the Commandant of the Coast Guard announced that Total Quality Management (TQM), which advocates participative management, would help chart the course towards improved effectiveness. Given this shift in command philosophy, an opportunity presents itself to evaluate the two alternative control systems for CSS cutters: external control through compliance inspections versus internal control through TQM practices.

## C. RESEARCH QUESTIONS

Primary Research Question:

What are the merits of TQM and compliance-oriented inspections as control systems for effective CSS operations?

Secondary Research Questions:

1. What is the current state of compliance inspections aboard CSS cutters?
2. How could TQM support a self-control mechanism aboard CSS vessels?
3. What happens to the current inspection organization if the Coast Guard adopts a self-control mechanism?

## D. SCOPE, LIMITATIONS AND ASSUMPTIONS

### 1. Scope

The research focuses on the similarities and differences of the management control systems offered by TQM and compliance inspections. CSS requirements, found in the Coast Guard Afloat Supply Procedures Manual (ASPM), serve as the baseline for this comparison. The analysis includes an evaluation of each system's advantages and disadvantages based on data gathered through interviews of Coast Guard personnel. After considering the different management tools suggested by the two approaches, recommendations are offered. This thesis does not provide an actual evaluation of a CSS cutter but provides a comparative analysis of two approaches towards control.

### 2. Limitations

A true comparison is difficult to make since TQM processes have not actually been applied on Coast Guard cutters. The analysis takes the theory and data gathered from the interviews to assess the merits of compliance inspections. This information is compared against applicable TQM theory and some insightful interview data about current Coast Guard self-control methods. CSS procedures are being implemented without being checked by compliance inspections. This approach, though not deliberate, has contributed to an environment of

innovativeness and self-control. This environment is similar to one a Total Quality approach to control would hope to create: one of innovativeness anchored by internal control mechanisms. Our comparative analysis, while not weighing the consequences of two active, different control systems, provides valid information regarding the merits of these systems to the Coast Guard.

Some of the 378s' operational schedules limited the research. Their underway periods prevented the interviewing of personnel assigned to the deployed cutters. The reduced number of interviewees, however, did not significantly impact the findings given the consistency of results.

### 3. Assumptions

Several assumptions underlie the thesis research:

1. The Coast Guard has a long term commitment to Total Quality Management.

2. The Executive Steering Committee and Quality Management Boards will actively support change in the oversight function.

3. TQM applications, now limited to Coast Guard shore facilities, will formally include cutters in the future.

4. Crew size and rank structure on board 378s will remain the same as presently configured.

## E. THESIS ORGANIZATION

Each chapter represents a major element of research. Chapter I introduces the research's purpose and methodology.

Chapter II provides background information that highlights the underlying issues central to control of the HEC logistics program. Chapter III describes the Coast Guard's TQM organization and its procedures. Chapter IV presents a review of the pertinent literature, including basic theory of control, theoretical applications of compliance-oriented and preventative control systems, and a description of parallel organizations. Chapter V presents and analyzes the data collected from the field interviews. Chapter VI offers an analysis of the two control systems and the implications they have for logistics planning and control. Chapter VII presents recommendations and conclusions concerning this research effort. Finally, several appendices provide information useful to the reader. For example, Appendix A contains a list of frequently used abbreviations.

## F. METHODS

The research included a review of pertinent literature associated with both TQM and compliance-oriented control systems. This review focused on the characteristics of both internal and external control systems and associated management techniques. By understanding the salient features of each system, a more thorough analysis of the Coast Guard's efforts is possible.

The researchers opted to use qualitative interviews versus quantitative questionnaires because of the exploratory nature of the thesis. Free-flowing interviews would provide the subjective data about the participants' full range of reactions to current and alternative control practices. The interviews were also meant to provide insight into local control and improvement practices on board 378' cutters.

The researchers selected interview questions by using brainstorming and multi-voting techniques. Primary questions had to meet certain criteria to be chosen: (1) open-ended in nature and (2) reflective of the primary and secondary thesis questions (previously listed in section C of this chapter).

Appendix B contains a list of the final interview questions. The list is split into two major sections: compliance inspections and TQM-related matters. Each major section is then divided into two sub-parts: primary questions and secondary questions. The primary questions were designed to invite a free-flowing discussion where the respondent would address the more specific issues listed in the secondary questions. The secondary questions served as a checklist for the interviewers, who could focus the respondent on a specific topic if the discussion started to wander.

The interview subjects included shipboard personnel and policy makers up the logistics chain-of-command. By asking

the questions at various levels in the command structure, the researchers hoped to determine how the different positions within the system viewed control. Interviewees aboard 378s included supply representatives (supply officers, assistant supply officers and storeroom supervisors) and command-level personnel (commanding officers, executive officers and engineering officers). Supply department representatives accounted for 17 interviews. There were nine command-level interviews. Off-ship interviewees included compliance team members, Maintenance and Logistics Command (MLC) representatives (logistics branch chief and ship support division members), and policy makers at the headquarters level (ELM branch chief, assistant branch chief, and policy analysis division members). These off-ship interviews accounted for 14 of the 40 total interviews conducted.

The interviews were conducted in person, and when necessary, by telephone. Before the interview began, the respondent was given a brief overview of the research's scope and was told of the researchers' commitment to the confidentiality of all responses. Interviews lasted approximately one to one and one-half hours. Both researchers participated in the interviews. One researcher primarily asked the questions, while the other wrote down the responses. Both interviewers, however, were free to interject follow-up

questions or to ask for points of clarification. As a means to improve the interview process, interviewees were asked to provide feedback as to the appropriateness and validity of questions.

The following chapters present the background, theory and interview data pertinent to control. By understanding the scope, assumptions, limitations and methods that guided this research, the reader can better evaluate our conclusions and recommendations about control systems aboard the Coast Guard's High Endurance Cutters.

# II. BACKGROUND

Chapter I offered an explanation of why a comparative analysis of alternative control systems is timely. This chapter provides background information that illuminates why the comparison is also topical. The background information reveals the strategic connection between the logistics system and unit readiness. The Coast Guard either strengthens or weakens this link when it puts in place a system to control its logistics functions. The background information, therefore, also serves as a backdrop for the comparative analysis. This information reflects conditions that the Coast Guard must consider when designing its control mechanisms. By understanding these conditions, the reader can better weigh our conclusions and recommendations about the Coast Guard's choices for control.

Chapter II begins with a discussion of Centralized Supply, its reasons for implementation, and its present status. The chapter then describes the Coast Guard's inspection system and its ability to control and improve the logistics system.

## A. CENTRALIZED SUPPLY ABOARD 378' CUTTERS

### 1. Reasons for Centralized Supply Implementation

In 1988, the Coast Guard implemented the centralized supply system on board its 378' cutters. Headquarters established this program to resolve longstanding support problems, such as poor shipboard inventory management and inaccurate ship configuration baselines. The intent of CSS is to formalize the connection between logistics and readiness. The following presents some background to the implementation of CSS.

The Coast Guard is a relatively small, mission-oriented public service. To live up to its official motto, "Semper Paratus" (Always Ready), the Coast Guard adopted an unofficial philosophy of mission first, support matters second. As the Coast Guard began to feel the hidden costs of such an attitude, it commissioned the Logistics Management Institute (LMI) to study the Coast Guard's internal supply system. LMI's study noted "two fundamental decision keys characterize the Coast Guard's management style: (1) invest in the supply support system only as much as necessary to cover the current problem, and (2) rely heavily on the Commanding Officer's initiative to overcome shortfalls in supply support when they occur." (LMI, 1988, p. 5) LMI reported that this management style encouraged supply inefficiencies.

A 1988 LMI study identified a raft of support issues facing the pre-CSS logistics organization.

> Deficiencies in Coast Guard shipboard supply management are apparent in many ways: required parts and supplies are not in stock, while unnecessary items occupy storeroom space; emergency local purchase and local scrounging are frequently necessary; maintenance officers and technicians must spend an inordinate time procuring repair parts and spares; quantities in allowance documents are not trusted; overbuying takes place and creates excess stocks; fund shortages cause delays in replenishment of needed items; and equipment/equipage validations indicate notable differences from recorded information. (LMI, 1987, p. 1-4)

The ailing logistics system was causing significant problems in readiness and sustainability.

The Coast Guard's organizational structure also reduced supply responsiveness. The structural design encouraged a fragmentary and piece-meal approach to supply support. The LMI study pointed out that each functional division at Headquarters handled its own logistics issues. Engineering, weapons and electronics divisions were independent, commodity-support representatives to the fleet. Each division made decisions about maintenance and support issues for their particular equipment and equipage. They devised logistics plans and issued support procedures to their functional counterparts on the HECs. This commodity advocacy led to each shipboard department managing its own spare parts inventory. (LMI, 1987, p. A-2)

This vertical, decentralized approach towards shipboard supply led to many support shortfalls.

- The shipboard commodity managers were more interested in maintenance tasks vice supply responsibilities.
- Separate departmental inventories limited visibility of duplicate spare parts and lost usage data. It also increased inventory losses and pilferage due to easier access.
- The various departments repeated their supply tasks so infrequently that they lost learning curve efficiencies.
- There was no focal point on board the vessel to be sure that configuration and allowance documentation were promptly and properly updated. Therefore, allowance lists did not reflect equipment updates.
- Local purchases increased to fill "emergency" requirements due to poor, departmental inventory practices.
- Unneeded allowance items occupied valuable storage space.
- The various departments viewed supply tasks as having little impact on the ship's mission. Tasks, such as spot inventories, stock record maintenance, financial accounting and supply analysis, went undone. (LMI, 1987, p. A3-A4)

Other external factors also influenced the Coast Guard's decision to centralize the shipboard supply functions. The fragmented nature of the pre-CSS logistics system prevented proper strategic planning. Also, the financially austere and operationally more complicated future called for a more responsive supply system.

> More expensive and complex spares and repair parts for new high-technology equipment installed on ships require earlier, more extensive planning for initial provisioning, procurement, and stock replenishment. Ships spending longer periods away from home port and procurement rules

> that are more restrictive make local purchase a less frequent option for obtaining material. Audit and inspection reports on supply support are critical of current means for shipboard allowance management, material accountability, and supply system effectiveness. Ships entering extended overhaul or modernization are found to be carrying large amounts of excess or outdated spares and repair parts. (LMI, 1987, p. iii)

### 2. Changing to a Centralized Supply System

To resolve its logistics problems, the Coast Guard centralized the shipboard supply functions. Headquarters hoped to reverse the deteriorating supply situation by changing the shipboard organization and strengthening its policies and procedures. The Headquarters Logistics Management Division (ELM), a branch of the larger Engineering offices, formalized the important connection between logistics and readiness. ELM pulled together disparate supply policies and procedures into one directive, the ASPM. They designed the document to increase supply support across the fleet by creating mandatory procedures and setting stricter performance standards.

The HEC shipboard organization changed to reflect the increased importance of supply-related issues. Supply manpower and capability grew with the addition of a lieutenant Supply Officer billet and two additional storekeeper billets. The supply officer became responsible for the newly consolidated departmental inventories. Beyond its previous

duties, the supply department was now responsible for all inventory management requirements: determining demand, maintaining allowances, and storing and issuing parts. The new Afloat Supply Procedures Manual reflected significant changes in policy and procedures. Other major innovations in supply policy included setting mandatory allowance levels for spare parts and instituting a stricter configuration reporting system.

Headquarters identified the anticipated advantages that CSS would offer over the old system.

- Supply and parts availability for the maintenance program would improve because of the inventories' consolidation under one department.
- The ship would record better usage history, and support levels above the ship would receive more accurate demand data.
- A single department with visibility of all material would improve inventory practices: stocking to mandatory allowance levels and eliminating duplicate items and unnecessary back orders.
- Departments would incur expenses at the time they receive material which would better reflect and support a performance-oriented budgeting system.
- Technicians would have more time to perform maintenance because of the more efficient use of supply personnel.
- A single point of control would better manage shipboard equipment, equipage, and property.
- The supply department would be responsible for control and reporting of shipboard configuration change reports. It would also maintain temporary postings to configuration records. (LMI, 1987, pp. 3-2 - 3-8)

When faced with the old system's myriad problems, headquarters decided that CSS offered significant opportunities for short-term relief and long-term improvements. ELM hoped that the new regulations and the cutters' additional manpower and expertise would provide quick improvements to previously mismanaged inventory systems. In the long-term, headquarters expected to change the mind-set that encouraged non-responsive logistics planning and execution. ELM hoped to convince the system's participants of the significant impact of logistics in readiness issues. CSS's short-term accomplishments would affirm this importance to the senior officers. The future senior officer corps, embodied in recently appointed supply officers, their peers and subordinates, would take their CSS experiences and apply them in their future billets.

### 3. Status of CSS Program

CSS's introduction to the fleet coincided with each ship's departure from an extended shipyard period. When a ship left FRAM (Fleet Rehabilitation and Modernization), its storeroom inventories were to reflect its allowance documents and critical machinery was to be in working order. Unfortunately, many of the 378s exited FRAM with inaccurate inventories, insufficient general supplies and a work list of broken equipment. CSS, therefore, started at a less than auspicious time. Technicians, concerned with fixing

equipment, resisted the new, unfamiliar CSS procedures. Storekeepers had to service their customers' current demands while simultaneously trying to correct allowance and inventory deficiencies.

A 1990 logistics conference, sponsored by ELM, documented these and other CSS growing pains. Round table discussions among HEC supply officers, assistant supply officers, and MLC and ELM representatives discussed many CSS and FRAM-related problems. Untrained storekeepers greeted centralized supply as additional, and often incomprehensible, work. CSS's intended customers, the engineers and other technicians, received it with skepticism and resistance. They saw CSS as an invasion of turf, an additional burden of unfamiliar paperwork, and an effort to exert administrative control over their technical experience. The ASPM was unwieldy, confusing and unclear. It did not adequately define the roles and responsibilities up and down the logistics chain-of-command. The computer software designed to execute CSS was ineffective and impeded rather than aided its implementation. The result: supply officers either altered or ignored CSS policy and procedures to meet their missions. (Commandant [G-ELM] LTR, March 1990)

Since its implementation in 1988, CSS has evolved with very little management oversight. Though ELM made some changes in policy and procedures as a result of the first logistics conference, many of the same problems continue to plague the system today. In March 1992, a second Afloat Logistics Workshop documented CSS's lingering troubles. The ships listed their concerns in point papers requested by MLC and ELM. Appendix C contains a summary of these point papers. Significant, recalcitrant problems include poor policy and procedural guidance, a deficient configuration baseline, unsupportive automation, and inadequate shore side support (MLC Pacific, 1992).

The net result of four years without a coordinated and systematic effort in implementing centralized supply is that, today, there are 12 HECs operating with 12 different versions of CSS. The Coast Guard must consider its options to control its supply system. The Coast Guard has historically depended on external compliance inspections to provide procedural uniformity. TQM, however, provides the Coast Guard with another management option, self-control at the unit level. Whatever the mechanism, it should identify systemic problems and improve shipboard procedures on a continuous basis.

## B. CURRENT COAST GUARD CONTROL MECHANISMS

### 1. Inspections

The Coast Guard has depended or compliance inspections to fulfill several needs. They determine conformance with federal laws, set a standard of unit and individual performance, and certify effective unit management. Inspections are a review of a command's administrative performance. Special items of interest include: personnel management, operations, human resource programs, and supply and fiscal management.

The Maintenance Logistics Commands are responsible for inspecting the 378s under their administrative control. About six weeks before the inspection, the MLC inspection staff sends the unit check-off sheets, which outline mandated procedures. The unit uses these lists to self-inspect before the inspection team arrives. The team consists of technical experts who check their respective specialty areas. Inspectors go beyond the scope of the checklists when significant problems arise in any area. Upon conclusion of the inspection, the team briefs the CO and files a formal report to the ship's superiors, the MLC and Area Commanders.

Since their exit from FRAM, many of the 378s have gone long periods without an inspection. Until recently, under-staffing and under-funding have hampered the full execution of

the MLC inspection mission. The lack of inspections has encouraged the growth of diverging supply systems across the HEC fleet. Furthermore, current inspections do not determine shipboard compliance with CSS requirements. They only examine commercial purchases and cashier accountability. They fail to check inventory practices, configuration management, and maintenance of mandatory allowances.

Headquarters (ELM) identified billets and funded the creation of CSS oversight teams. The team members reported to the MLCs for duty this past summer. These people are not members of the regular MLC inspection team. They are located in the Logistics Division on the West Coast and in the Vessels Section on the East Coast. Confusion exists about their mandate. While there is interest in compliance checks, the team members feel their duties include training, familiarizing shipboard personnel with ASPM procedures, and identifying policy and procedural shortfalls. To date, the Pacific MLC team has trained only one vessel. This ship had recently implemented CSS and most of its crew members had not received any ASPM training prior to the team's visit. This singular case does not present enough information to determine the value of this type of oversight visit. Whether these teams will introduce procedural uniformity to the system is unknown.

### 2. Personnel Evaluations

While not the focus of this study, personnel evaluations also serve as a means to control the Coast Guard's supply system. The Coast Guard relies on its members to follow the policies and procedures outlined in its official documents. Knowing that the quality of individual efforts differ, the Coast Guard uses its evaluation systems to regulate performance. The enlisted and officer evaluation systems help maintain a level of competence in the fleet.

Daily oversight by the ship's supply officer should guarantee compliance with CSS requirements. If the supply officer's skills, aptitude, or attitude are deficient, however, then system compliance diminishes. Likewise, if the supply officer's supervisor has little or no supply experience, oversight by top shipboard management decreases. In such cases the supervisor may only detect those failures that impact directly on unit performance. The supervisor will not catch problems dealing with system efficiencies or economies. While personnel evaluations may play a role in workplace motivation, they may be limited in their ability to control shipboard supply processes.

## C. SUMMARY

The Coast Guard, being such a small service, must use its limited resources wisely. The earlier problems of poor inventory management and fragmented logistics planning required systemic changes in shipboard supply support. CSS was the response to this need. Unfortunately, it began as the 378s were exiting FRAM, thus diminishing, if not negating, the improvements it promised.

By instituting CSS, headquarters changed shipboard organizations, policies and procedures. It did not, however, make a commensurate change in the supply system's control mechanism. Compliance inspections have only recently reached HEC vessels, and even then, they do not evaluate CSS procedures. TQM's rise as the management tool-of-choice in the Coast Guard may offer some suggestions for an improved control system. Whatever the resulting mechanism, the Coast Guard must institute some form of control over its CSS system or, possibly, re-experience the problems of the past.

# III. THE QUALITY ADVANTAGE

The Coast Guard's move toward Total Quality Management has definite implications for its control systems. The philosophies associated with TQM are radically different from those that support compliance-based control. TQM advocates a customer-driven, process-oriented mechanism while compliance inspections promote a management-driven, product-oriented system. This chapter provides the background information necessary to understand the possible ramifications of adopting a TQM philosophy.

Rather than reviewing various TQM models, Chapter III introduces the reader to the Coast Guard's variant, The Quality Advantage, or TQA. Chapter III begins with a look at why the Coast Guard turned toward TQA as a means to improve its overall efficiency. The chapter then discusses TQA's guiding principles, its associated management structures, and its processes for continuous improvement.

## A. BACKGROUND

In 1990, the commandant wrote to senior Coast Guard officials about his desire to improve the service's performance. "I believe we need to adopt a quality philosophy

toward continuous improvement as a long-term servicewide goal directed from the top." (Kime, 1990) Such a philosophy would allow the Coast Guard to respond more effectively to growing regulatory demands and tighter budgets. At a Flag Conference that same year, he and other flag officers developed a TQM charter, which served as the basis for future TQM efforts.

In late-1990, the Coast Guard hired Organizational Dynamics, Inc. (ODI), a consulting firm dealing in quality management. ODI introduced the Coast Guard to a version of TQM called The Quality Advantage (TQA). This eclectic blend of management ideas and methods rests on five elements called "Pillars of Quality." Organizational values of honesty, commitment to customer satisfaction and commitment to self-improvement are the foundations of TQA's Pillars. (Williams, 1991, p. 7)

**1. TQM Defined**

While training manuals label the philosophy and theory as TQA, various Commandant Instructions continue to use TQM interchangeably with TQA. The Coast Guard defines TQM as "a strategic, coordinated management system for achieving customer satisfaction that involves all managers and employees and uses quantitative methods to continuously improve an organization's processes."(COMDTINST 5224.7, 1991,(encl) p. 1) The organizational instruction further describes TQM as "both

a philosophy and a set of skills for managing and improving work." This philosophy has two basic principles:

- Focus on the process as the key to producing and delivering quality products and services, and
- Achieve customer (internal and external) satisfaction and exceed their expectations. (COMDTINST 5224.7, 1991, p. 2)

**2. Coast Guard Commitment to TQM**

Often, actions speak louder than words. The Coast Guard has committed itself to significant innovations to secure TQM's promised advantages. It has adopted a relatively new management structure, an overlay organization, to enhance its creativity. The Coast Guard has also created a computer network to enhance organizational connectivity and increase communications flow through out the chain of command.

The Coast Guard's TQM Training Plan also reveals a high level of support. Successful implementation required a critical mass of 2000 trained personnel. After receiving initial training from ODI, the Coast Guard organized its own training center to be sure that follow-on instruction would be available.

Each of the Coast Guard's ten geographic districts have begun using TQM at their shore-side facilities. There is little TQM activity, however, aboard Coast Guard cutters.

This lack of TQM aboard ships is understandable since initial TQM training and other activities focused on shore commands. (Commandant (CCS), 1991, p. 2)

The Coast Guard's vision statement reveals a definite sign of its commitment to TQM. It begins, "The United States Coast Guard is committed to continuous improvement of its performance as the world's leading maritime humanitarian and safety organization. . ." Continuous improvement is a TQM cornerstone. Its prominent place in the first line of the vision statement underscores the extent of top management's dedication to improvement. Vice-Admiral Daniell, the Vice-Commandant of the Coast Guard, summarized TQM's mandate at a 1991 conference.

- TQM is the wave of the future for the Coast Guard.
- TQM allows us to address the anxiety of rapid change and complex choices we face.
- TQM continually challenges the way we do things. Does the old way still make sense?
- TQM is here to stay - it's not a drill, fad or experiment.
- TQM will cost money and time, and we are prepared to make this investment. The commandant decided to proceed with TQM after much thought and study - TQM was not an accidental choice. (Bulletin, March 1991, p. 26)

## B. GUIDING PRINCIPLES

Organizational values of honesty, commitment to customer satisfaction and to self-improvement are the ideals upon which

TQA rests. In turn, these values support TQA's five Pillars of Quality. Figure 1, on the following page, shows these pillars to be Customer Focus, Total Involvement, Measurement, Systematic Support, and Continuous Improvement. ODI describes each pillar as critical to a structurally sound TQA approach. (ODI, 1989, p. 8) By understanding TQA's philosophical foundation, a clear distinction can be drawn between compliance control systems and a Total Quality approach. To address these distinctions, the implications of each TQA principle to Coast Guard management and control practices are briefly discussed.

**1. Customer Focus**

To satisfy customers, workers and management must understand their customers' requirements. Daily processes link individuals to their internal customers and suppliers. TQA insists that by responding to internal customers' needs, the final product will satisfy the external customers' requirements. Everyone in an organization is both a customer and a supplier. That is, everyone involved in the process receives or gives information, material or services to someone else within the organization. External customers receive a better, higher-quality product if everyone within the process focuses on their internal customers' needs.

This precept differs from past Coast Guard philosophy in that TQA broadens the number of stakeholders in policy formulation. Previously, top management's concerns were the focus of policy and process formulation. Under TQA, however, both internal and external customers are able to have input into process design.

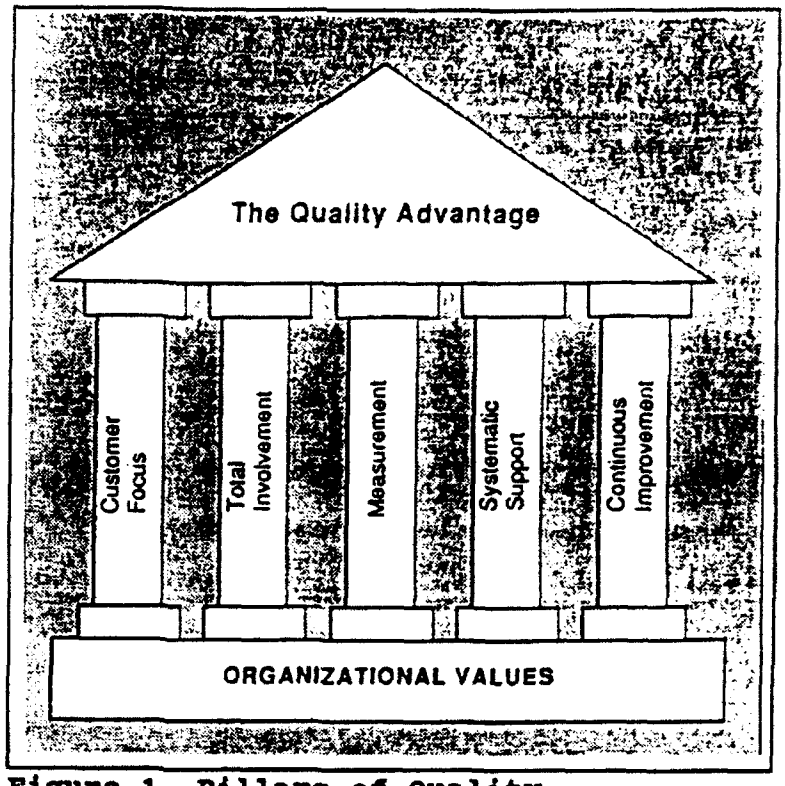


**Figure 1 Pillars of Quality**

**2. Total Involvement**

Quality is not just the responsibility of management or the quality control team. Everyone in the organization has an obligation to instill quality in their work. Management must empower its workers. In the pursuit of quality, management should give its workers control over the workshop processes. The workers, consequently, must not look to management or the inspection team to check for quality. They

must hold themselves responsible for their efforts. Moreover, both management and workers must work together to look for ways to improve the system's chances for quality.

This new philosophy challenges the Coast Guard's mentality of managerial responsibility. Currently, headquarter units formulate and enforce policy. The Coast Guard has tried to instill quality through its inspection programs. TQA calls for everyone in the organization to be involved with policy formulation and quality control, not just top management and their inspection teams.

**3. Measurement**

Monitoring quality is a central precept of TQA.

> You cannot manage what you cannot measure. You cannot measure what you cannot operationally define. You cannot operationally define what you do not understand...You will not succeed if you do not measure. (Sink, 1989, p. 74)

Careful measurement of processes is critical to effective long term improvement and error prevention. Goals for quality are essential. They provide a baseline against which management can compare process measurements. TQA believes that customer requirements should define the quality goals.

Coast Guard inspections are designed to look at the end product, a paper trail indicating procedures have been followed. TQA moves beyond document-checking to an on-going, statistical measurement of processes. TQA insists that

quality increases by monitoring processes not through after-the-fact inspections of products.

**4. Systematic Support**

Though TQA has a participative philosophy, management plays a key role in achieving the organization's quality goals. The organization's top level decides how to design its management systems. These, in turn, impact system and individual performance. How an organization plans, budgets, monitors and rewards performance impacts directly on the system's products. Management systems, therefore, should reflect the organization's commitment to quality.

The Coast Guard's current control system does not support a Total Quality objective of process improvement. Compliance checklists and the inspections themselves indicate a concern more for individual accountability than for process correction. This philosophy affects how individuals and units perform their duties. TQA requires policy makers to carefully consider whether current management systems support a quality organization.

**5. Continuous Improvement**

The ability to seek process improvements is dependent on an understanding of customer needs. A system that encourages good internal customer-supplier relationships will be more innovative and, thus, more responsive to external

customer requirements. Individuals, and the system itself, must support efforts that prevent repeat, controllable errors. By controlling these types of mistakes, time and money are available for more work or finding improvements to the system.

This idea of constant process review is different from Coast Guard inspection practices. Headquarter units conduct unit inspections on an annual or biennial basis. These infrequent inspections create great leaps in improvement rather than the steady, continuous improvement advocated by TQA.

## C. TQA MANAGEMENT STRUCTURES

In an attempt to construct its own pillars of quality, the Coast Guard has created a parallel organization. This structure serves as a mechanism that lets the formal organization slowly inculcate TQA's guiding principles while increasing its ability to adapt and innovate. The following section explains why the Coast Guard feels it needs another organization to increase its adaptation skills. It also introduces the reader to the implications that such a structure poses.

### 1. Parallel Management Structure

TQA/TQM's goals are radically different from that of inspections. TQM aims to improve quality by focusing on work

processes rather than by inspecting end products. TQM strives to achieve customer satisfaction rather than compel simple rule-following. To support this change in basic philosophy, the Coast Guard has decided to introduce TQM through a management overlay structure.

> The Coast Guard needs to create a parallel organization which will be an overlay on the existing organization. The existing organization structure exists to carry out the mission--to get work done. The TQM organization we are about to create--staffed by existing personnel--will exist to improve the work processes through which we deliver services to our customers...no reorganization will be necessary to carry out TQM...The TQM organizational overlay links all parts of the Coast Guard vertically and horizontally...it reinforces our chain-of-command...It will also allow us to control and to coordinate the improvement activities of our people. (COMDTINST 5224.7, 1991 p. 2)

The Coast Guard Implementation Team effectively declared the regular organization unable to deliver quality improvements or to concentrate sufficiently on issues of customer satisfaction. The overlay structure, however, should not take on an organizational life of its own. It should emphasize, instead, the importance of quality to the existing organization. The Coast Guard's implementing instruction states, "A new organizational structure or shadow organization is not desirable. The goal is to change the way we do business, not to add a new layer of bureaucracy." (COMDTINST 5224.7, 1991, (encl) p. 13)

Whether this goal is achievable is an important question when considering the implications of this new structure. If an organization's members do not commit to TQA's philosophy, then they will most likely consider the overlay structure's activities as additional, bureaucratic red tape. Another question is whether parallel and formal organizations can co-exist. The transformational impact of parallel structures on organizational culture may be more than top management is willing to endure. For example, military organizations invest very heavily in maintaining formal lines of authority and communication. Parallel structures diffuse authority and communication. In the Coast Guard's case, Headquarters must decide if it is willing to ease its control over decision-making in favor of increased innovation through power sharing. Parallel structures pose serious questions for control mechanisms. The answers to these difficult questions are unknown; however, this research is meant to delineate the alternatives as clearly as possible.

**2. Overlay Organizational Elements**

TQA tries to increase worker participation in decision-making processes. To encourage this inclusive approach, the overlay structure uses new organizational elements that parallel the Coast Guard's regular management structure. The elements include the Coast Guard Quality

Council (CGQC), Executive Steering Committee (ESC), Quality Management Board (QMB), Quality Action Team (QAT), and Natural Working Group (NWG).

*a. Coast Guard Quality Council (CGQC)*

The CGQC is the highest level TQM group in the Coast Guard. Its members include only the highest ranking admirals at Headquarters and at the Area commands. This council is responsible for defining TQM and developing its policies. It sets strategic goals, provides resources, defines quality indicators, and sponsors QATs as required. (COMDTINST 5224.7, 1991, (encl) p. 2)

*b. Executive Steering Committee (ESC)*

The ESC is also a top management council. Each major command (i.e., Headquarters, Areas, MLCs and Districts) has one ESC to oversee its TQM efforts. The ESC provides direction and resources to the QMBs that it has chartered. It identifies internal and external customers. It targets those cross-program issues that most impact critical customer requirements. It assesses QMB recommendations and action plans for effectiveness and value. It informs all process owners of lessons learned through TQM efforts. (COMDTINST 5224.7, 1991, (encl) p. 3)

*c. Quality Management Board (QMB)*

QMBs are permanent structures whose members include cross-functional managers responsible for a range of processes. ESCs may charter as many QMBs as it has regular organizational departments. This element of the overlay structure corresponds to the divisions found in major geographical commands (i.e., Headquarters, Districts, MLCs and Areas). By establishing a QMB within each department, the QMB can focus on issues affecting that division's specific customers.

QMBs conduct most of the TQM efforts. They may charter, however, temporary QATs to aid in data collection and analysis. QMBs consider ESC-assigned issues. It uses TQM procedures to identify and analyze a problem. (A later section discusses these procedures in greater detail.) It removes obstacles to continuous improvement. If the QMB has the authority, it makes process changes and then checks performance to assess the impact of those changes. It shares its lessons learned and standardizes its successes within its own sphere of influence.(COMDTINST 5224.7, 1991,(encl) p. 5-6)

*d. Quality Action Team (QAT)*

As stated before, QATs are temporary groups called to consider intricate problems. These problems concern "process issues or opportunities for exploitation that are

important to analyze and that are often cross-functional, multi-level and interdisciplinary."(COMDTINST 5224.7, 1991, (encl) p. 8) The QAT consists of three to seven people who have first-hand knowledge of the process in question. As such, QAT members may represent any level of command as long as they have the requisite knowledge of the process in question. The QAT uses TQM procedures to conduct its data collection and analysis. It makes action recommendations to its chartering QMB and then disbands.

*e. Natural Working Group (NWG)*

These groups are the basic elements of every Coast Guard unit. They consist of an individual and the people with whom that individual usually works. This group is an ongoing entity that should examine every work process for improvement. It would use the TQM procedures to collect and analyze data to determine if its processes are in control. NWGs should bring significant improvement issues to the attention of its regular or TQM chain-of-command to increase success standardization.

NWGs are different from QATs in that NWGs are permanent groups brought together by the nature of their job. As such, NWGs deal with the wide-range of workshop processes or, if it desires, a specific issue. QATs, on the other hand, are comprised of people who are selected for their ability to

represent different constituencies. QATs are temporary groups that are more focused since their charters are defined by their QMB.

### 3. Linking Structure

Figure 2 presents the overlay organization as a linking structure. The triangles represent different management levels within the Coast Guard. The marked areas represent the points of interaction at various levels in the structure. This parallel organization allows

- horizontal linkage by having different working group members serve together on cross-functional teams.
- vertical linkage by having a member of a higher group serve as chairperson of the next lower group. (COMDTINST 5224.7, 1991 p. 3)

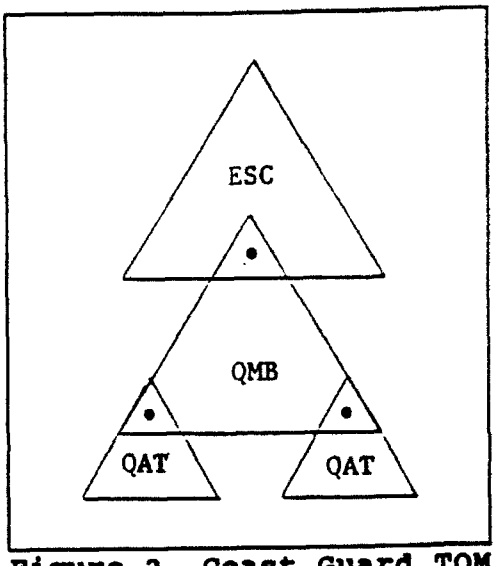



**Figure 2 Coast Guard TQM Linking Structure**

An example of the overlay structure would show the ESC in the uppermost triangle. The second triangle would include the members of the QMB. The leader of the QMB would be a member of the ESC, thus providing vertical linkage. The lower

triangles would be QATs. The QATs' team leaders are members of the QMB, thus providing horizontal linkage within the organization.

#### 4. Advantages of the Overlay Structure

The primary advantage of this structure is its ability to link various levels of command with each other. This formalized interaction leads to additional advantages.

- Horizontal linkage enables QMB members to coordinate efforts across organizational boundaries.
- Vertical linkage enhances goal alignment and communication flow up and down the chain-of-command.
- By the departments working toward the same goals, cross-purpose efforts decrease.
- It fosters teamwork and lessens internal competition.
- It improves standardization of improvements. Solutions from one group may be applicable to other sectors of the Coast Guard. (COMDTINST 5224.7, 1991, p. 2-4)

### D. TQA'S FADE PROCESSES

The principle method for problem solving is Focus, Analyze, Develop and Execute (FADE). The goal is not only to correct the problem but to prevent it from happening again. This process is a group effort involving all team members who are considering a particular issue. As Figure 3 shows, the process consists of four phases: Focus, Analyze, Develop, and Execute. Each phase has its own goals, tools for analysis and

end products. Figure 3 shows the goals in the outermost ring, the phases' steps in the center ring and the phase name in the innermost ring. By the end of the FADE process, the group should have considered all its options and reached an optimal decision. Then the organization executes the team's plan and checks its impact. FADE is an iterative process. The impact of the team's first Execute phase often leads to the Focus phase of the second iteration. In this way, FADE promotes a continuous improvement process.

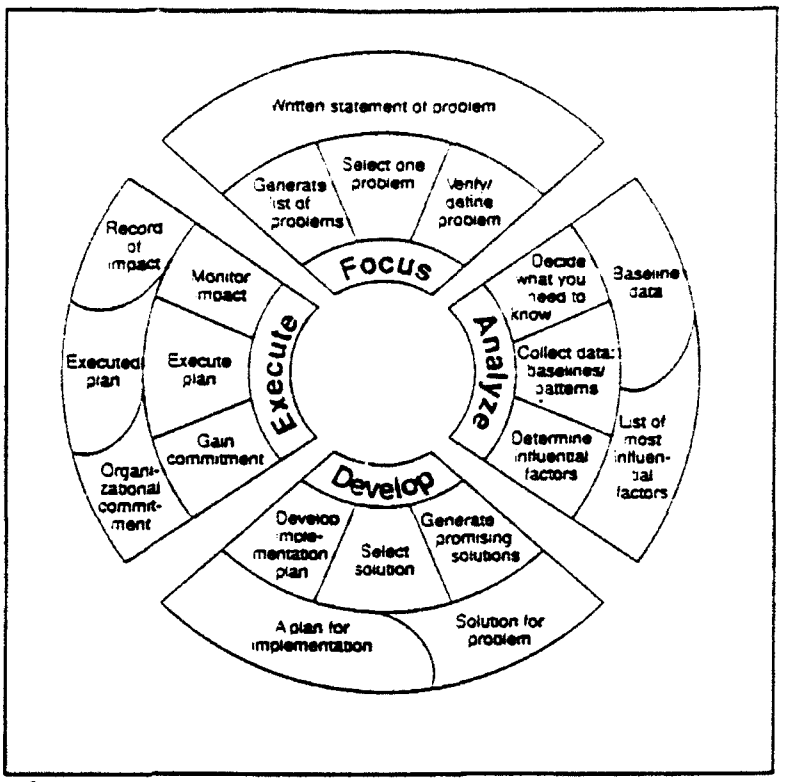



**Figure 3 FADE Processes**

### 1. Focus

This phase's goal is to define the problem. TQA defines a problem as "a situation that is different from what is wanted." (ODI Handbook, 1990, p. 7) Three steps move the team toward this end. First, the team generates a list of

problems. Second, it selects the problem that presents the greatest opportunity for improvement. Third, the team verifies and defines the situation in a written statement.

To complete these steps, the team uses several tools. These include brainstorming, multi-voting techniques, a selection grid, and impact analysis. Brainstorming is a free-flowing discussion of ideas. This technique "encourages tolerance and creativity as people build upon each other's ideas." (ODI Handbook, 1990, p. 10) Multi-voting techniques and a selection grid allow the team to choose and focus on one alternative. The impact analysis describes why the organization should improve the situation. It also validates the team's concentration on that specific case and serves to focus the team's future efforts. (ODI Handbook, 1990)

**2. Analyze**

This phase has two goals: to gather baseline data and to determine the critical factors affecting the situation. The team takes three steps to accomplish these goals. The team first decides what it needs to know about the defined problem. Then, it collects data and sets performance baselines. With this information, the team picks out the significant factors. This measurement/analysis phase is critical. It enables the team to identify the problem's root causes and to seek permanent improvements to the system. (ODI

Handbook, 1990) The use of objective data helps eliminate "gut feeling" determinations of systemic problems.

The tools used to complete this stage include many methods used in the Focus phase. Additional tools involve checklists, a data-gathering plan, various statistical sampling techniques, and analysis aids. Pareto charts and fishbone diagrams help the team to deduce the reasons for the problem. A Pareto chart is a bar chart that shows, by distribution, the incidence of problem causes in various categories. A fishbone diagram is a schematic presentation of the factors influencing a given situation. By gathering data and analyzing it, the team can objectively determine the most significant element of the problem.

**3. Develop**

Once the team has identified what it believes are the significant factors, the Develop phase begins. This phase has two goals: (1) find a solution to the problem and (2) arrive at a plan for implementation. There are three steps in this phase to accomplish the goals. After generating a list of possible solutions, the team picks one and then develops an implementation plan. The solution ideally resolves the immediate situation and prevents a recurrence of the original problem. It should also produce benefits that are worth the time, cost and effort required to fix the problem. To be

successful, the plan should consider if there is enough support to see it brought to conclusion.

This phase uses several new tools. They include innovation transfer, cost-benefit analysis, force-field analysis, and written plans and procedures. Innovation transfer helps generate a potential solutions list by applying solutions from other situations to the one under study. Cost-benefit analysis considers the financial ramifications of particular solutions. Force-field analysis helps the team understand the forces that may help or hinder the plan's implementation thus assessing expected levels of support. Written plans and procedures help the team to visualize their solution. They also set organizational accountability for specific actions and outline departures from past procedures. (ODI Handbook, 1990)

**4. Execute**

The Execute phase is the final phase in the FADE process. At this stage, the team is looking for an organizational commitment for their plan. Once support is in place, the organization executes the plan and then makes a record of its impact. "While earlier phases required flexibility and new ways of thinking, [this phase] requires dedicated action to execute the decisions that have been made." (ODI Handbook, 1990, p. 10) Commitment should be

inherent to the FADE process. Ideally, the team consisted of the people committed to the prospect of change. These include the workers involved with the affected process, people outside the process who could promote or obstruct the plan, and, possibly, external customers.

The team has a self-interest in the plan's execution. The group should use their previously written plans and procedures as a blueprint to carry out the change. Once the plan is in effect, the team uses its previously defined measures of effectiveness to gauge the plan's impact.

Tools to gain commitment include personal bids by team members to gain political support, group presentations, statistical sampling, and specifications and control limits. Appeals to groups and key individuals may be necessary to assure long term support for the proposed change. Sampling, specifications and control limits allow the team to check to see how far actual events deviate from expected results. This ongoing feedback can also encourage continued commitment as individuals track the progress of the execute phase.

## E. SUMMARY

The Coast Guard views TQA as the management method that best meets its needs for continuous improvement. The Quality Advantage relies on values of trust, honesty and a desire to

perform at personal-best levels. These values form the underpinnings of a management structure focused on the customer and continuous systemic improvement. Management and worker support, as well as effective performance measurements, are critical for innovation and improvement.

The Coast Guard has adopted a strategy that calls for the creation of an overlay organization. This structure parallels the regular organizational structure but encourages participative management and the flow of ideas through out the organization. This design hopes to increase innovation, enhance customer-supplier relationships and institutionalize successful improvements throughout the organization.

The FADE process identifies problems, generates solutions and then observes the system after the plan's implementation. Focus, Analyze, Design, and Execute are phases in TQA's improvement cycle. This iterative process encourages worker participation and concentrates heavily on data-gathering, analysis, and constant process review. The Coast Guard hopes this measured approach toward improvement and innovation will enhance the management of its limited resources.

# IV. LITERATURE REVIEW

This chapter summarizes the relevant literature on control systems as it applies to this research. It introduces the management concepts central to our comparative analysis. The first section will cover control systems: what they are and why organizations have them. It provides a generic model of control that will serve as the framework for our analysis. The chapter's second and third sections present this analysis of traditional, compliance-oriented inspections and the alternative Total Quality approach to control, respectively. Chapter III introduced the Coast Guard's overlay structure as a mechanism to increase organizational innovativeness. The last section of this chapter explores the theory behind these parallel structures, their purpose, philosophies, advantages and limitations.

## A. CONTROL SYSTEM FUNDAMENTALS

### 1. Definitions

Agreeing on basic terminology is important when analyzing management systems. The wide-ranging definitions of control reflect the many theories about this subject. In this thesis, definitions reflect the Coast Guard's bureaucratic

nature. This distinction is important because the organization's environment and structure impacts directly on the control mechanism.

> Structures channel effort and energy in a particular direction. Since they channel effort, changes in structure can lead to changes in how people behave at work...The essence of the bureaucratic organization is the production of standardized, predictable, replicable performance by many different people and/or groups...The basic parameters of a bureaucracy are centralized control, task specialization, functional grouping and internal standardization. (Bushe, 1991, p. 3-6)

Most bureaucratic organizations are large and complex in nature. In order for them to be effective, "such organizations require some system for monitoring and redirecting their diverse and specialized activities." (Gortner, 1989, p. 204) Toward this end, control is the "means used by an organization to elicit the performance it needs and to check whether the quantities and qualities of such performance are in accord with organizational specifications." (Euske, 1984) This definition supports the criteria that a bureaucracy's control system "assist in the management process and guide and correct the bureaucracy's efforts to achieve its mission." (Gortner, 1989, p. 215)

**2. Design for Efficiency or Innovation?**

The organization's bureaucratic character channels individual and group efforts in a certain manner. The

longstanding debate surrounding organizational design is how to best channel these efforts to achieve desired results.

> Contingency theory in organization design basically asserts that in a stable environment the best thing to do is organize for efficiency, and in an uncertain environment, organize for innovation. This is seen as a basic trade-off. Organizational characteristics that lead to innovation are the opposite of those that lead to efficiency. Studies of long-term organizational effectiveness, however, reveal that it is possible to be both efficient and innovative. (Bushe, 1991, p. 15)

Control systems, especially very different approaches like compliance inspections and TQM, can influence the delicate balance of efficiency and innovation. Bureaucracies seek strict adherence to procedures through their inspections. This procedural standardization increases efficiency but only by decreasing the ability of subordinate units to adapt procedures to their immediate environment. Dynamic, innovative organizations, on the other hand, lose consistency of effort when they allow subordinate units to change rules and standards to meet local demands. These type of organizations are prone to adopt controls like those advocated by TQM. This approach of unit-level or self-control allows some questioning and experimenting with established, system-wide procedures. Gortner poses a difficult question to bureaucracies concerned with balancing efficiency and innovation through the design of its control system. "Should it [the control system] serve the information needs of

internal adjustment (innovation) or the requirements of political and legal accountability (efficiency)?" (Gortner, 1989, p. 213)

### 3. Basic Model of Control

The fact that the Coast Guard is a bureaucratic organization plays an important role in our analysis of external and self-control mechanisms. Its bureaucratic culture and activities are impacted by the philosophical and systemic issues raised by these dissimilar control systems. A basic model of control provides a framework to better delineate the differences between external control (e.g., inspections) and internal control (e.g., TQM-based processes). By reducing these larger systems to their basic components, the analysis puts the two control methods into sharp contrast.

Figure 4, on the following page, shows the basic model (Aldag, 1991) as having eight activities. Seven of the eight are clearly stated: goals and objectives, standards and rules, behavior and activities, results, measurement and comparison, evaluation and reward and corrective action. The remaining element, feedback, is inferred by the model's arrows. The illustration does not imply that feedback is a secondary consideration. In fact, the model suggests that feedback is critical since it is the element that joins all the others together.

The model depicts the cycle of control. Goals and standards are set. Then, behavior and activities are monitored and compared to desired performance. If corrective action is required, steps are taken to redirect the activities toward more desirable results. Rewards are used to reinforce behaviors that complement the organization's goals. These eight elements of control have different levels of significance in various control systems. The following sections show the relative importance of these components in a compliance mechanism and in a TQM-based system.

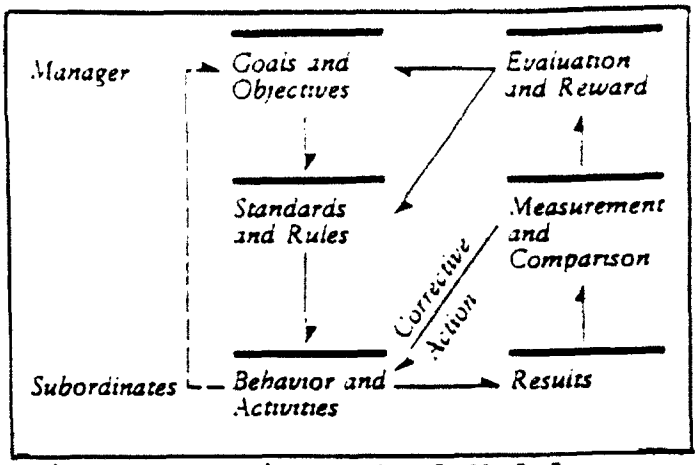



**Figure 4 Basic Control Model**

## B. EXTERNAL COMPLIANCE INSPECTIONS

As the Coast Guard moves toward a continuous improvement philosophy, it should revisit earlier decisions about its control systems and the impact they have on organizational

goals of efficiency and innovation. The Coast Guard's historical use of compliance inspections should not go unchallenged.

### 1. Normative Assumptions

Compliance-oriented control systems are supported by a philosophy very different from that which supports continuous improvement. There are number of normative assumptions about individual values that bureaucracies have long used to justify a strict, rules-oriented means of control.

> Subordinates naturally dislike and avoid work. Subordinates are motivated through extrinsic threats and rewards. Organizations must make systems idiot proof. Subordinates should only be seen working and not heard. There are experts for everything, and only they know what is important. (Bushe, 1991, p. 120)

An organization that considers its people to lack motivation and who naturally dislike their work will build a control mechanism that reflects these beliefs. Bureaucracies break down tasks into simple repetitive actions. One person supervises a number of subordinates, and authority figures make all the decisions. The goal of a bureaucracy's control system is to "enforce its rules and standards by managing people through tasks." (Bushe. 1991, p. 120)

### 2. Goals and Objectives

These normative assumptions lead organizations to design systems that leave the unmotivated and untrustworthy workers out of decision-making processes. Bureaucracies leave the responsibility for defining goals and objectives to top management while relegating its subordinate personnel to roles of implementation.

Gortner states that policy makers often define the bureaucracy's strategic goals on the basis of legal requirements and on the need to ensure organizational survival.

> Externally generated laws form the basis of rational bureau activity. Executive-branch agencies at every level of government are subject to numerous legal and political checks. A bureau is subject to control by outside authorities, and internal control is maintained by the chain-of-command leading to a politically accountable executive. (Gortner, 1989, p. 207)

Since it cannot trust its workers to comply with legal requirements, a bureaucracy must ensure its continued viability by establishing a hierarchical structure that designs and enforces rules from the top.

### 3. Standards and Rules

Policy makers define organizational goals and then establish a control system to attain them. Compliance inspections provide a mechanism to ensure subordinate units are following the procedures laid out by top management. The

closer subordinate units follow the procedures, the more secure management feels about meeting its requirements. Detailed rules, therefore, are fundamental to compliance oversight.

> The most efficient organization requires competent execution of well-designed work routines. Such organizations routinize as much work as possible and search for ever better routines to do more with less. This is efficient because rules and routines act as a means for coordinating labor. (Bushe, 1991, p. 26)

Compliance inspections reinforce this process of standardization. This type of control diminishes threats to meeting organizational goals by errant individuals by identifying and eliminating nonconformists and non-performers. Procedural uniformity throughout the organization guarantees top management of meeting its requirements as efficiently as possible.

**4. Behaviors and Activities**

The effort to standardize tasks has important implications for the organization. It places a heavy burden on top management who must define the work processes. To achieve consistency, management must publish error-free procedures. This task is daunting because management's own tasks are different from that of organization's workers. If management publishes ill-defined procedures, the organization loses consistency of effort.

Compliance inspections also create certain behaviors at the worker level. This type of control motivates workers to simply follow procedures. This may increase efficiency but it decreases individual innovation. Organizations may become more concerned with rule-following than output. "When evaluations are ultimately based on rule compliance, rule following may become the real goal, thereby displacing the original service goal." (Gortner, 1989, p. 217) By creating a rule-following work ethic, compliance inspections increase the pressure on top management to design effective work procedures that truly meet its overall goals.

**5. Results**

A control system is designed to minimize the variance between what is expected and what actually occurs. By making the jobs as routine and mechanical as possible, bureaucracies design in a level of quality control.

> ...bureaucracies coordinate work through rules, regulations and standardization of work processes and skills. By designing how each individual task should be done and then ensuring that people do it that way, standardization of work processes builds coordination of work right into the job design. (Bushe, 1991, p. 7)

The quotation above reveals the expected results of compliance inspections: standardization. Compliance inspections are an after-the-fact measure of conformance with established rules. Compliance inspections check the behavior and activities of

individual members and sub-units against desired standards. This double-check assures management of a consistent work effort. Bureaucracies, as was shown earlier, desire this uniform work effort to meet their goals of survival and political accountability. The strictness of the compliance inspection, however, determines the level of uniformity and the resulting efficiency attained by a bureaucracy.

**6. Measurement and Evaluation**

Organizations commit to performance criteria from which they do not like to deviate. When situations develop that take a process out of accepted parameters, variation exists.

> ...processes are subject to two sources of variation: normal and abnormal...Normal variations are common to all elements of a process. Abnormal variation is due to a special or specific cause...Some researchers estimate that abnormal variations cause 15% of the problems in a process, while normal variations cause the remaining 85% (Gitlow and Hertz, 1987, p. 1-18)

To control variation, organizations set up systems to capture signals of non-conformance. In this analysis, we see that different control systems are interested in different types of variance.

In the traditional, compliance-oriented system, inspections may focus on either: (1) variance in rule-compliance and (2) finding defects in the system's end

products. Manufacturing firms that depend on mass inspections examine their end products for unacceptable defects. Service industries, like bureaucracies, use inspections to check for conformance with established procedures. In both cases, compliance inspections indicate a concern more for isolated results rather than for problems throughout the inspected process.

In the Coast Guard's case, compliance inspections determine if units are following Headquarter mandates. The inspection team uses a checklist to compare individual activities and behaviors with procedures outlined in published directives. The review of a vessel's past performance means that the Coast Guard inspections occur after its work processes are already completed. In this way, compliance inspections serve as a control mechanism primarily concerned with detection of errors after they have occurred. Thus, the focus is on measuring the degree of compliance with standards and rules more than evaluating the complete system of processes (e.g., behaviors and activities) that contribute to results.

Figure 5, on the following page, illustrates the timing issues associated with this type of detection-oriented control system. The process relies primarily on some type of after-the-fact inspection of end products. Based on reports

about defective products, those in charge of the process adjust it. A quality control group (e.g., an inspection team) often provides the information required to improve the process. (Siegel, 1987, p. 57) This information, however, tends to be time-late.

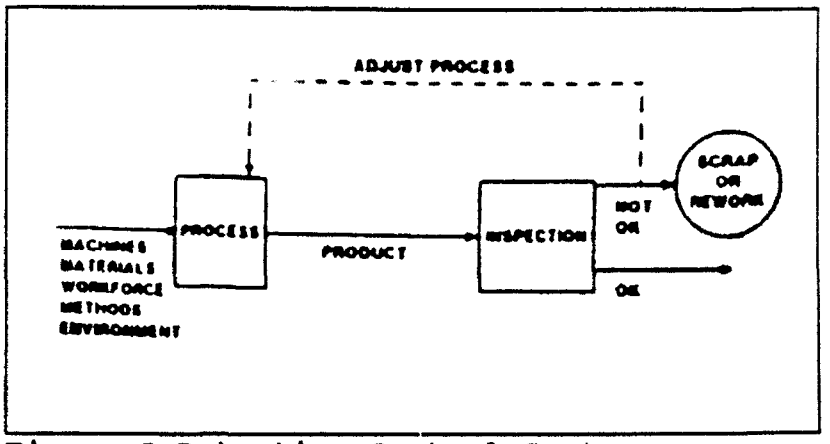


**Figure 5 Detection Control System**

A detection-oriented control mechanism, like compliance inspections, creates waste.

> The drawback associated with detection is that unacceptable product must be produced before people can determine how to adjust the process. Obviously, this wastes resources, for it costs just as much to produce an unacceptable product as acceptable one....(Siegel, 1987, p. 57)

Since Coast Guard inspections only determine rule-compliance at a specific time, there may be a period where the unit follows improper procedures. Late detection increases waste and reduces system efficiency.

**7. Corrective Action**

As noted in the last section, control systems are interested in minimizing variance. Management assures itself

of faithful application of procedures by examining end-products. The after-the-fact inspection process supports the idea that the bureaucracies are more interested in workers' past actions than in correcting process problems.

In an earlier quotation about variation, errors were described as being caused by normal errors 85% of the time. These types of errors are often systemic problems under the cognizance of management's control. Compliance-oriented control systems, however, end up blaming people for these mistakes. Inspections consider most variation to be caused by poor implementation of otherwise good rules. Rarely is the process considered to be at fault.

At the end of an inspection, the inspection team makes a report up the chain-of-command about individual and unit performance.

> In most companies, the quality control system is designed to go beyond control of product features and process features. The system is also used to control the quality performance of organizations and individuals, for example, departments and department heads. (Juran, 1989, p. 151)

Workers and mid-management may become more interested in passing inspections than in delivering a good product. This type of goal displacement may achieve a short-term, higher consistency of actions, but, in the long term, only serves to decrease system efficiency.

Some inspection reports are never used because of the type of information they hold.

> The accuracy of data may be questionable because of collection problems or distortion, and it may be difficult to get agreement on what constitutes good program output measures. Often, data for control are collected but are not used because of the political or professional sensitivity of those data or because the knowledge of how to correct or redirect organizational efforts is missing. (Gortner, 1989, p. 215)

The results of compliance inspections must be filtered through management's political lens before corrective action can be taken.

**8. Rewards**

Compliance inspections allow management to determine faithful adherence to its rules. The organization seeks to reinforce behavior that supports full compliance. Personnel and unit evaluations are used to strengthen system-wide support for management's policies. Those people who comply with organizational procedures are rewarded with positive evaluations. Non-conformists, however, receive negative ratings and may be forced out of the organization. In this way, the control system increases uniformity but culls out innovativeness.

**9. Feedback**

Each control mechanism uses a different system to move information within the organization. Whatever the system, an

effective communications link "collects and conveys information upward and routes it to actors who can interpret and use it for making new policy or program choices." (Gortner, 1989, p. 205) Both compliance inspections and TQM-based control systems are different in the way they collect information and use it to direct process changes.

Compliance inspections use formal reports as their primary feedback method. Reports are used for informing management about needed changes in their directives and compelling subordinate units to change their activities.

Compliance inspection reports deliver information up the chain-of-command about how well procedures are being followed. In this way, policy makers can report to their political superiors that their legal requirements are being satisfied. Furthermore, in a bureaucracy, top management is solely responsible for updates and changes to their regulations. Inspection reports, when aggregated, present management with an opportunity to evaluate the efficacy of their procedures. If enough subordinate units show non-conformance, management may perceive a need for change. In this slow and ungainly manner, reports may generate some innovation in the form of new regulations.

Compliance reports also provide management, via their inspection teams, an opportunity to identify and correct

improper behaviors at subordinate levels. By reporting deviations to the unit's superiors, the inspection team hopes to compel changes in unit-level activity. This type of top-down feedback allows management to reinforce those activities that achieve its desired results.

The tendency to reinforce established procedures blinds the organization to possible process improvements. When an inspection team discovers non-conformance, the team considers the unit's procedural changes not as innovations but as unsanctioned deviations from published policy. By reporting deviations to supervisors, unit-inspired innovations are lost when steps are taken to bring the unit back into compliance. In this way, the reinforcing, top-down nature of compliance feedback reduces organizational learning and innovativeness.

### C. A TOTAL QUALITY SYSTEM

By using the basic model, presented in Figure 4, as a framework for analysis, we have broken down the theoretical components of compliance-oriented control systems. We now turn this same framework to the analysis of the Coast Guard's alternative system, self-control as promoted by TQM.

### 1. Normative Assumptions

Intrinsic to TQM mechanisms is a profound belief in individual motivation. The normative values associated with TQM are a radical departure from those associated with compliance inspections.

> Subordinates naturally want to be involved in their work and will volunteer for greater involvement. Subordinates are motivated through recognition and the opportunity to influence events. Systems allow for individual creative contributions. Subordinates are encouraged to give their ideas and opinions. Everyone knows something important about his or her work. (Bushe, 1991, p. 120)

These beliefs influence the structures that use TQM processes. TQM procedures encourage groups to grapple with whole tasks. These groups, lacking a formal hierarchy, become responsible for resolving questions of internal leadership. They must learn to make their own final decisions through a consensual process. Procedures are designed to question the organization's formal rules. Compared to compliance inspection's "managing people through tasks," TQM systems strive to "manage tasks through people." (Bushe, 1991, p. 120)

### 2. Goals and Objectives

While a compliance system would advocate the preeminence of top management, goals and objectives under a TQM system are defined by people of all ranks and stature, in and out of the organization. TQA's Pillars of Quality

(Chapter III) discussed how an organization can increase its quality by focusing on its customers. Anybody, either internal or external to the system, who benefits from an organizational process, is a customer. By trying to satisfy the needs and wishes of customers, an organization continuously improves its processes and increases the quality of its product.

### 3. Standards and Rules

A Total Quality Management system takes advantage of the individual's desire to succeed. By increasing worker participation in system monitoring, evaluation and adaptation, TQM hopes to formalize a process of continuous improvement. Effective participative management requires

> moving the responsibility and accountability for planning, problem-solving, and decision-making to the lowest appropriate level; learning how to share information, knowledge, power, and rewards; managing the transition from manager-led to self-managing work groups. (Sink, 1989, p. 52)

Participative management would require significant changes within a bureaucratic organization like the military. TQM mandates power-sharing and joint decision-making. It requires that workers have the ability to adjust the process as they see a need. In this sense, the organization must open its rules and processes to questioning and experimentation. Chapter III's discussion of TQA's Quality Action Teams and the

FADE process reflects the types of TQM mechanisms often suggested to empower workers and to improve the overall system.

**4. Behaviors and Activities**

Process-oriented control systems, while promoting innovation and adaptation, may be difficult to achieve in a bureaucratic setting. "Structures that result in innovation and change require considerable slack and tolerance of inefficiencies." (Bushe, 1991, p. 26) Bureaucracies strive to limit inefficiency through its compliance inspections. Strict rule compliance is a defining characteristic for bureaucracies. TQM suggests that every policy and every procedure is open to question. Flexible processes are not a mark of bureaucratic organizations.

Workers must be empowered by the organization to make changes in processes as areas of improvement are identified. Bureaucracies may exhibit a certain reluctance to share its power throughout its ranks.

> Bureaus are generally required to firmly fix responsibility for actions in reporting to external governmental bodies. To the extent that participatory control in the public sector really does allow officials to establish and monitor their own professional performance standards, this requirement [participatory efforts] could be interpreted as interfering with external accountability channels. In fact, however, many legislative and judicial policy-makers give bureaus wide discretion in defining programs. (Gortner, 1989, p. 222)

While legal requirements may not actually prevent power sharing, authorities within the bureaucracy may reject such efforts in the name of legal accountability.

**5. Results**

Workers are required to gather statistical data about their processes' efficiency, responsiveness and effectiveness. The taking of measurements over time makes sure that the organization focuses on continuous improvement.

> A TQM process of oversight management is, by definition, a continuous process. Commanders at every level assess performance and proficiency by taking measurements, providing data and following trends. This information, as it is passed up and down the chain of command, become management indicators of ongoing improvements in proficiency, in performance, and in the process itself. (Naval Reserve DET 420, 1992, p. 31)

Total Quality Management argues for self-control over processes. This means that workers are responsible for tracking their customers' satisfaction and improving processes as problems and solutions indicate. If the workers learn of a process failure, changes to process must be based on statistical data and not made by nebulous "common sense" approaches. Improvements made on "gut feelings" have a tendency to sub-optimize the system in some fashion. TQM processes, like FADE, are designed to identify the optimal solution with the aid of workers and customers alike.

### 6. Measurement and Evaluation

Statistical information is central to TQM processes. Without data gathering, the advantages of worker participation and power sharing diminish. Participative management schemes are not effective if there is no supporting data to suggest areas for improvement. Measurements "provide a method for logically and systematically evaluating information. Specifically they help determine process stability, the ability to consistently meet consumer requirements, and the causes of problems." (Siegel, 1987, p. 57)

Figure 6 shows that continuous measurement of both the product and process is crucial to preventing procedural and product defects. Self-control over internal processes increases the likelihood that workers would identify systemic problems before product completion. This focus indicates a more prevention- versus detection-oriented philosophy. The difference between self-control and compliance inspections is this focus on process versus

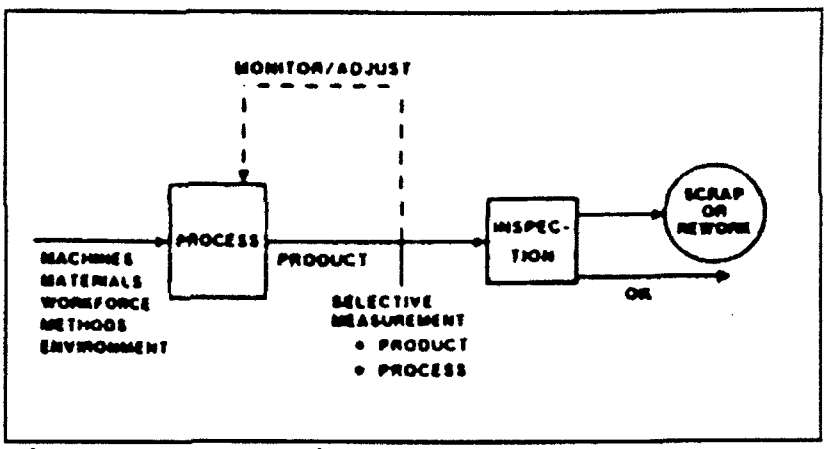



**Figure 6 Prevention Control System**

isolated end products. Self-control mechanisms not only measure the results themselves but multiple factors that can influence the results. These factors include but are not limited to activities, behaviors, rules, procedures, and any number of other inputs (e.g., machinery, material, workforce, methods and environment). The measurement of a wide range of factors allows a quality organization to determine more precisely the causes of procedural or product defects. This statistical data allows for a deliberate, continuous improvement process.

With data playing such a pivotal role, a Total Quality organization must make sure that measurements are actually supporting its organizational goals. TQM requires well-defined goals and performance standards. Should there be any confusion about these goals or standards, errors in measurement may occur. Organizations may collect data at the wrong point in the process, or they may not collect it at all.

> Data may suffer from problems of inaccuracy, invalidity and from ambiguous or conflicting standards for evaluating results. The accuracy of output measurement may be compromised by the kinds of intentional and unintentional distortion common to organizational communications. Validity is compromised whenever there is uncertainty or conflict over the definition of the organization's program outputs. (Gortner, 1989, p. 210)

Compliance and TQM-type control systems depend on data regardless of its intrinsic problems. The organization should take these drawbacks into consideration when designing or choosing its control system.

**7. Corrective Action**

Both compliance and TQM control systems require remedial action when problems are identified. Compliance inspections tend to focus on individual implementation issues as the cause of procedural problems. Self-control systems, however, focus management's efforts on systemic causes, both behavioral and procedural in nature.

An earlier quotation about variance indicated that 15% of all errors were caused abnormal situations. TQM control systems would state that this same figure equates to the percentage of time that worker error is the cause of problems. TQM insists that systemic issues are the primary culprits in process failures. These systemic factors can derive from any of the areas described as targets for measurements in the previous discussion (e.g., rules, task activities, materials). It is through the use of statistics that self-control processes are able to identify specific cause-and-effect relationships. Without statistics, management is left with "common sense" solutions and sub-optimized processes.

> Confusions between common and special causes of variation leads to frustration at all levels, more variation, and higher costs...The only safe way to differentiate the sources of variation is through statistical signals. (Gitlow and Hertz, 1987, p. 1-18)

**8. Rewards**

Total Quality systems do not depend on extrinsic rewards to reinforce behavior. This is radically different from compliance inspections which motivates its workers through positive or negative reports, promotions and bonuses. A Total Quality organization recognizes that an important source of motivation includes intrinsic factors. As TQM's basic philosophy asserts, people work hard because they want

to excel and to express themselves as professionally as possible. System improvements are made gladly and are their own rewards.

**9. Feedback**

The flow of information inside a Total Quality organization is critical to its ability to innovate and continuously improve. Customer feedback is the first step in goal definition. Workers must strive to form close internal and external customer-supplier relationships. In this way, the organization can closely monitor its requirements.

Statistical data is constantly generated at the work station and must be used by workers and management alike to determine if the processes remain within acceptable tolerances. If data suggests a problem, management and workers must be open to each others' ideas and concerns. Total Quality improvement processes, like FADE, hinge on the ability of customers and suppliers and workers and management to identify and resolve complex issues together.

## 10. Results of Framework Analysis

By using the basic model's eight elements as a framework for our analysis, we found that compliance control systems are rule-specific, top-down managed, detection-oriented, and product-based. By using this same analytical framework, TQM systems were found to be rule-innovative, process-based and prevention-oriented. Table I provides a quick-look comparison of the two control systems.

**TABLE I CONTROL SYSTEM ATTRIBUTES**

| | COMPLIANCE | TQM |
|---|---|---|
| **Goals and Objectives** | Defined by policy makers<br>Legal accountability | Internal and<br>External customers |
| **Standards** | Product-oriented<br>Detailed rules | Process-oriented<br>Flexible rules |
| **Behavior and Activities** | Extrinsic motivation<br>Top-Down coordination<br>Position power | Intrinsic motivation<br>Shared learning<br>Expert power |
| **Results** | Procedural uniformity<br>Efficient | Continuous improvement<br>Innovative |
| **Measure and Evaluate** | Infrequent<br>Detection oriented<br>Checklists<br>External teams | Ongoing<br>Prevention oriented<br>Statistics<br>Self-monitoring |
| **Corrective Action** | Behavior focused<br>Individual Accountability | Process focused<br>System Accountability |
| **Rewards** | Extrinsic<br>Promotions and OER's | Intrinsic/Extrinsic<br>Personal satisfaction |
| **Feedback** | Top-Down<br>Infrequent | Down-up<br>Frequent |

## D. PARALLEL LEARNING STRUCTURES

As part of its efforts to employ TQA, the Coast Guard has set up an overlay structure. Chapter III described the overlay as using workers and managers to resolve complex problems within a parallel, linking structure. This section explores more closely the theoretical underpinnings of this concept.

### 1. Purpose

There are three major areas of study about the purpose of parallel learning structures (PLS).

> One group focuses on parallel learning structures as a way for managers to resolve ill-defined, complex problems...Another group focuses on these structures as a way to build adaptability into bureaucratic organizations...A third group focuses on learning structures as a way to transform bureaucratic organizations. (Pasmore, 1990, p. 173)

Current theories hold that an organization's transformation goal will impact on the type of parallel structure it will design. Each of the three distinctive goals of parallel learning structures are elaborated below.

First, if problem solving is the goal, the organization sets up a temporary parallel learning structure. Bureaucracies can handle well-defined, routine issues but are unable to deal effectively with multi-faceted, complex problems. "Parallel learning structures overcome this problem

because those closest to the problem and those with authority to implement solutions are involved in recommending solutions." (Pasmore, 1990, p. 175) What differentiates this type of structure from task forces or committees is that parallel learning structures must have a non-authoritarian, non-threatening environment to enhance problem-solving.

Permanent parallel learning structures can also help organizations to become more adaptable. In this case, a PLS supplements the formal organization on a permanent basis. The permanent steering committee provides continuity and direction to efforts to improve innovation. Smaller groups chartered by the steering committee may be temporary as fits the nature of the problem. The PLS reflects the formal organization so it can retain the advantages of a well-structured, heavily-resourced bureaucracy. It promotes individual efforts, however, within the parallel structure to gain the advantages of innovation. Theorists advocate that individual initiatives (intrapreneurism) within the organization require a PLS to flourish. The parallel learning structure formalizes a framework of support, development and implementation groups. In this way, an otherwise rigid organization can nurture innovation. (Pasmore, 1990, p. 174-177)

The last function for PLS suggested by theorists is for cultural transformation. As the PLS committees and groups

meet, they establish different norms and rules. As group and committee members cycle back into the formal organization, they take these new norms with them and encourage their use in the formal structure. In this manner, the PLS infuses the bureaucracy with ideals supportive of participatory management. As these ideals flourish in the organizational mainstream, innovation and adaptability increase. This "seepage of ideas," however, may cause a shift in political coalitions. This may invoke a preemptive response from the power houses in the bureaucracy. If the power holders find it too threatening, they might terminate the parallel learning structure. (Pasmore, 1990, p. 180)

The Coast Guard hopes to use a parallel learning structure to increase its organizational innovation. The parallel or overlay structure, described in Chapter III, would allow a free-flow of ideas and present an opportunity to resolve complex issues through a customer-supplier dialogue. Theory states organizations that use a PLS to increase innovation should be concerned with possible cultural transformations. There is some question whether a military organization, with its hierarchical culture, can co-exist with a participative, TQM-based parallel structure. The various group processes advocated by TQM require power sharing and organizational relationships based on expert power rather than

positional power. These cultural differences may lead to two possible results: (1) the formal organization adopts the culture of the PLS, or (2) the formal organization terminates the parallel structure.

**2. Scope of Effort**

Decision-makers must review many organizational aspects when contemplating a change to management processes.

> A technological intervention is a change in the technology and/or structure of an organization with the purpose of improving or stabilizing the entire socio-technical system in that organization. All organizations are composed of a technical system (the technology, formal structure, rules and regulations) and a social system (informal groups, cliques, patterns of interaction) nested in an environment. (Bushe, 1991, p. 2)

An attempt to redesign a bureaucracy must consider the impacts on not only the organization's structure but also on its technological base and its social systems.

**3. Basic Characteristics**

Most people characterize bureaucracies as rigid, task oriented, multi-layered hierarchies. To move beyond the problems associated with such structures, bureaucracies build parallel structures, a type of technological intervention. Parallel structures, regardless of their strategic purpose, have elements in common.

> In its most basic form, a parallel learning structure consists of a steering committee that provides overall direction and authority and a number of small groups with norms and operating procedures that promote a climate

> conducive to innovation, learning and group problem solving. Members of the parallel learning structure are also members of the formal organization, though within the parallel structure their relationships are limited to the formal chain of command. Some parallel learning structures are set up on a temporary basis, while others are intended to be permanent. (Bushe, 1991, p. 10)

As the quote shows, organizations design a parallel learning structure to be a non-intrusive reflection of the formal organization. To "promote a conducive climate," parallel learning structures must be flexible, with few rules and loosely defined tasks. One of the key characteristics of a PLS is that it requires the organization to set aside a time and a place away from daily operating concerns so the group may consider future opportunities. Open communications are critical to this type of intervention. A parallel structure's operating norms must be different from those of the formal organization. It must promote cooperation, non-hierarchical relations and effective group problem solving. (Pasmore, 1990, p. 172)

**4. Challenges in Implementing Parallel Structures**

One underlying principle colors every form of parallel structure: people will act differently in the PLS than they do in the formal organization. By creating an environment that encourages members of the formal organization to express themselves and their ideas, parallel learning structures hope to improve the overall system. What theorists do not know is

whether or not people will be able to transition easily between the restrictive, authoritarian bureaucracy and the non-hierarchical, free-wheeling parallel structure.

> Simply setting up a parallel structure will not, in and of itself, make people more courageous. But establishing clear boundaries and role expectations that build legitimacy for such behaviors surely increases the possibility that people will risk a different way of behaving at work. (Bushe, 1991, p. 11)

Even though the system sets up a safe haven for new ideas, the movement between the two structures may be confusing to people. When they are members of the PLS, people should question the organization and all its rules. When they return to their normal duties, however, these same people must comply and ensure compliance with the organization's procedures.

## E. SUMMARY

An organization divides labor and resources to accomplish its goals. It then sets up a control mechanism to make sure that its actions equal its desired results. For bureaucracies, control derives from a need for organizational survival and to meet legal requirements. Inherent to any control mechanism is a feedback loop of information to those who have control over the organization's processes. Without accurate and timely data, the organization may not know to adjust its processes and, therefore, it may operate outside acceptable parameters.

This thesis concerns itself with two alternative control mechanisms. The first alternative, compliance inspections, is an after-the-fact detection of errors. This type of oversight rests on normative values of management-employee distrust, a belief that individuals lack motivation and commitment to the organization's work. These beliefs lead to a system where management generates all policies, checks for consistency of effort and is the only element that may make changes to existing policies. This type of system can lead to wasted resources, rule following, and time-late corrections to the system.

Self-control through a Total Quality approach offers the Coast Guard an alternative to compliance inspections. This type of control system is preventive in nature because it uses statistical measurements to review process and product alike. Normative values of trust and individual motivation are the cornerstones of TQM. The success of this type of participative management depends on the degree of recalcitrance of the bureaucracy in which it is practiced and the quality of data on which decision-making is based. Organizations using TQM must encourage power sharing and must devise methods to ensure data validity.

To improve their existing processes, organizations have turned toward parallel learning organizations to supplement their normal activities. Bureaucracies, to promote consistency, have been found to stifle learning and innovation. By providing its members a parallel system to support their ideas, bureaucracies hope to foster innovation in its formal organizational practices. Bureaucracies also use these parallel environments to solve complex problems and to encourage a cultural transformation within their organization. The free-flow of ideas within the parallel structure is critical to its success. Some question exists whether people can effectively contribute to a parallel structure and return to perform consistently within the bureaucracy.

# V. FIELD INTERVIEWS

Chapter IV provided the theoretical attributes of both compliance and TQM-based control systems. The interview data, presented in this chapter, allows us to determine if these theoretical differences are supported by data from fleet and support personnel.

As Chapter I described, the interviews were conducted with personnel in the logistics chain-of-command. Interviewees included supply and command representatives of 378s and shore side policy makers and inspection personnel. The interviews were designed to create a free-flow of subjective data about the participants' full range of reactions to current and alternative control practices. The interviews also provide insights into local control and improvement practices on board 378' cutters.

Chapter V continues to use the framework of the basic model of control to guide the analysis. The framework is used in the first section to evaluate interview data about compliance inspections. The next section presents interview data about self-control practices that have been implemented by CSS.

As discussed in Chapter I, this analysis does not represent a true comparison between TQM and compliance practices since TQM has not been implemented aboard High Endurance Cutters. The CSS environment, however, does present a view of self-management and innovation often associated with a Total Quality approach to control. While the interview data does not fully represent a TQM system, we feel the research provides an understanding of the differences between compliance and self-control.

## A. COMPLIANCE INSPECTIONS

Chapter IV presented the delicate balancing act a bureaucracy must face when designing its control systems. The balance of efficiency (i.e., procedural uniformity) and innovativeness (i.e., ability to learn) is difficult. Literature suggests that bureaucracies settle for efficiency at the price of innovativeness. (Bushe, 1991) One of our interview goals was to examine how the Coast Guard's compliance inspections have affected the balance of these two important organizational attributes.

The actual design of the control system may serve to enhance organizational efficiency or its innovativeness. In the compliance model, policy makers tell the field what they consider to be most important through published directives.

The compliance action itself reinforces this prioritization of procedures. Presence of items on checklists and attention to specific details by inspectors highlight the importance that Headquarters attaches to certain rules.

**1. Goals and Objectives**

The organization's control mechanism reflects the group that owns the process. In the theoretical model for compliance inspections, we learned about top management's preeminence in control of the process. Management first defines the processes in its published goals and standards and then asserts its ownership through rule-checking enforcement.

The theoretical model for compliance inspections suggests that policy-makers should feel in control of their processes. Coast Guard policy makers, however, revealed significant frustration with the Coast Guard's compliance system. Policy makers at both the MLC and Headquarters level expressed consternation with the amount of seemingly unenforceable procedures. "When policy makers put pen to paper, it is obviously important or the instruction would not be signed. It's crazy for us (the Coast Guard) not to follow the instructions." The general consensus among top management was that unit personnel choose the policies they wish to follow. Policy makers felt this selective rule-following reduces the effectiveness of central authority. "If there's no

one out there nailing these guys (for non-conformance), why should they follow the rules?" The interviews suggest that theory and reality agree that policy makers define goals and objectives. Equally important, the interviews revealed that enforcement of policy is critical to its success. The data also supports the normative assumptions posed in Chapter IV; workers must be watched and their actions corrected to ensure conformance.

**2. Standards**

A critical area of importance to the compliance model of control is the dependence on published procedures. Bureaucratic control theory suggests that if management wants uniformity of procedures, then it is responsible for building the best procedures possible.

For CSS, the interviews revealed mixed feelings at the policy level about the need for ASPM compliance. Some policy-makers felt the supply manual should represent guidelines that would allow some autonomy of action and provide for some unit-level innovation. "It's hard to tell if the ships are getting sufficient guidance from the ASPM. Now is not the time for hard-nosed compliance checks, but time to let the ships figure out and improve the procedures." Others felt that the ASPM represented orders and should be followed to the letter. This latter group felt that headquarters should not allow

independent changes to procedure. "The Coast Guard should not issue guidelines, but orders, when it issues policy. Ships get to pick-and-choose whatever they want to do now. Why bother writing policy if no one follows it?" This latter group felt that if a unit wished to challenge certain procedures, the unit should do so by bringing the questionable procedure to the attention of the policy makers for their review. Thus, there is not a shared view regarding the desirability of standardized procedures for CSS. Some of the interviews reflect an orientation supporting unit-level discretion and innovation while others indicate strong support for strict enforcement and uniformity.

Besides its detailed rules, another theoretical attribute of compliance inspections is its focus on products rather than on processes. Coast Guard inspections support this focus by looking at the documentation that result from a supply department's rules and procedures. "They come aboard and they check my files and my paperwork. They can get pretty picky." Even then, the ships generally agree these are the areas that require additional work prior to the inspection visit. "I have my people clean up the loose ends in my files. I review old purchases and straighten up my property records." Many of the ships pointed out the same areas. This fact

speaks about the priority that the fleet attaches to these general requirements.

For those items that compliance inspections did check, most supply officers felt the checklist requirements were important but minor when compared to their CSS practices. Inspection-required changes were easy and were usually trivial in terms of their impact on effective supply operations. "There's a number of checklist items that really don't matter. For example, I don't know why I need a letter-to-file telling me who can purchase things. If they (the inspectors) want one, I can gin one up in a hurry, but it's a waste of my time."

**3. Behaviors and Activities**

Management theory holds that compliance-oriented control systems are coordinated from the top-down and that behaviors are directed by the organization's hierarchy as reflected in its procedures. The interviews support theory only in that the shipboard hierarchy provides the extrinsic motivation needed to compel rule-following. The interviews showed ships responding more in accord with their commanding officers' wishes and not necessarily in line with directives.

The interviews confirmed the policy makers' concerns that ships were not adhering to all published directives. Most unit personnel admitted to selecting the procedures they

wished to follow. The majority stated that this selection process resulted from the large number of requirements placed on the ships. "If I did everything on the checklists, I would get very little done that's important." In the name of time management, shipboard leaders had to determine which requirements would have the greatest benefit for the ship. One Executive Officer, echoing his peers, labeled this process as an "unfortunate cost of doing business."

While all the CO/XO interviewees considered most of the requirements to have administrative value, they acknowledged the preeminence of operational concerns. Procedural requirements would not constrain most of the commanding officers if they felt their operational capability was being impaired. "Ships do not sail for the lack of an easily attainable part. Economics are important but should not prevent my sailing." "If I feel a certain pump would make my operations better, then I would change it even if I were told not to. It's my ship."

These last quotations do not serve as object lessons in logistical short-sightedness. They represent the attitudes inculcated by a Coast Guard culture that encourages and depends on personal initiative and innovativeness. Historically, these traits have proven invaluable when commanding officers have been faced with a sluggish, non-

responsive supply system. The interviews clearly support LMI's assertion (found earlier in Chapter II), "the Coast Guard relies heavily on the Commanding Officer's initiative to overcome shortfalls in supply support when they occur."

A commanding officer's initiatives have long motivated shipboard subordinates. In this case, COs use inspections to motivate their subordinates. One commanding officer stated, "I believe people do a lot better when placed under pressure. Compliance inspections provide that pressure to perform, and I don't mitigate it [the pressure]." Subordinates adopt the attitude that their commanding officer's project about the importance of inspections.

The interviews revealed an interesting aspect about how people view inspection standards. Most respondents, policy makers and shipboard personnel alike, stated they felt that inspection standards were performance minimums. The ships should strive to exceed the checklist requirements. They admitted, however, that a work-up period was required to bring the ship into line with checklist standards. The ship's performance level would improve during the inspection period, but it inevitably would slide back to pre-inspection standards. Most officers stated "almost after every inspection the ship falls back to business as usual." While ships may think their requirements are minimum criteria, they

are, in actuality, treated like maximums. "If I could just maintain all the checklist standards for a period of time, I would be happy." This shows that checklists lead to the acceptance of published standards with few ships seeking to move their performance beyond the standards. This supports management theory that procedural uniformity, while increasing efficiency, reduces innovativeness.

There is not, however, agreement about the efficiency of behaviors undertaken to achieve procedural uniformity. The work-up period before the actual inspection relates directly to the issue of efficiency. COs and XOs felt that this work-up period was a useful training period. Time spent was minimal and did not detract from routine business. "My people don't spend any time on preparing for inspections. We've been following these procedures all along." "Sure, there's some work up but it's only about a week or so. It doesn't hurt us to clean up our paperwork a little." These statements contradict, however, what supply officers and their subordinates feel. Their interviews state that the work-up period is excessive and significant time and effort is spent preparing for the inspection. The time spent on inspection-related items was time spent away from regular, operations-related work. "We spent our last three month deployment working on the checklist. We had to push off our normal

routine to take care of this stuff. Not that the regular work doesn't get done, it just gets done later."

When asked whether this practice of working up to an inspection was efficient, most inspectors stated, "had the ships been doing their job properly all along, there would not be a need for an extensive work-up period." One inspector felt that work-up periods were poetic justice for past choices. "Don't come crying to me about how messed up you were and how long it took you to get ready for the inspection."

While rule-following is the predominant behavior, the interviews indicate a conflict with theory in that not all rules were obeyed at all times and it is the ship's hierarchy that motivates conformance, not top management. Additionally, while the inspection elevates shipboard performance for a short while, it does not prevent a return to previous sub-standard performance. This suggests that compliance inspections only fix short-term problems but do not compel systemic improvement or motivate quality performance.

**4. Results**

Theoretical attributes include procedural uniformity and the resulting organizational efficiency. The Coast Guard's inspection program assures a certain level of uniformity and does gain some advantages in learning curve efficiencies.

Chapter IV pointed out that compliance-oriented control theory supports results that meet organizational goals of survival and political accountability. The interviews revealed some confusion between management's desired results and the fleet's expectations about inspections. Coast Guard inspectors "conduct inspections to forestall waste, fraud and abuse." Their aim is strictly administrative. While shipboard personnel appreciate this mission, there is some idea that inspections should be more focused on readiness-related processes. Management, through its compliance inspections, does achieve for the most part uniform results. "As long as I have been inspecting, most of the ships have been doing what they are suppose to. We haven't had many negative reports at all." As previous sections have indicated, however, there is some selectivity on the part of the ships about rule-following.

The shipboard interviews indicated a mixed feeling about the intended results of inspections. At the supply department level, most interviewees felt that inspections should focus more on readiness than on uniformity. One supply officer, echoing most of his peers, remarked "What I get marked on (evaluated) is whether I get this ship away from the dock with all the right parts. No one looks at that." The belief that Coast Guard management should look at these types

of readiness issues is not necessarily shared by command personnel. One commanding officer stated "I'm not sure I want that sort of oversight. It may very well cut into my prerogatives as the CO." A dissenting opinion at the command level is represented by another commanding officer's remarks. "My boss already has an idea about my readiness level through the SORTS report (an operational status message). It's no big deal to me, but I question the value of an inspection that looks at those sort of procedures. The inspectors may not know what my people really do to get this ship underway, and I'm not sure I want them (the inspectors) to know." Thus there is not a consensus among shipboard personnel about the intended results of compliance inspections. People at the worker level feel that inspections tied to their actual functions would better evaluate their efforts while command personnel seem more interested in maintaining their autonomy.

All the policy makers felt that the inspections were designed to ensure uniformity of procedures across the fleet. They also believe that inspections were designed to primarily benefit Headquarters. "I believe every ship should be doing supply procedures exactly the same, no questions asked. This would help to reduce the learning curve quickly." "We don't have the time or the money to be training people as they move from ship to ship." The entire organization would benefit

from standardized procedures. Policy makers felt the fact that ships receive additional training and oversight is a nice but secondary benefit of compliance inspections.As pointed out earlier, the actual compliance process reinforces the system's desire for efficiency. The process of sending out advance checklists and then conducting a thorough oversight visit ensures that organizational units are following published directives. The reader is reminded that while CSS processes are not checked, other supply functions such as commercial purchases and property accounting are major parts of current Coast Guard compliance inspections.

The inspection checklists give the ships advance notice of the relative importance of specific procedures. One executive officer said compliance inspections were good for the ships administratively because "inspections force you to look at the instructions." Most COs and XOs stated that the checklists have become integral parts of their regular command functions. "I make my department heads use the checklists in the relief process. These lists also help to drive regular training and work requirements." Compliance inspections also increase unit training. "If you have the right inspector, you can get a lot of good training out of an inspection." Through internal and external training then, procedural uniformity increases.

**5. Measure and Evaluate**

Theoretical attributes of infrequent, detection oriented control is well supported not so much by the interview process but by the facts surrounding Coast Guard inspections. The Coast Guard inspects on a biennial basis, using an external inspection team, armed with a checklist, to conduct a paperwork review to determine compliance with established procedures.

The COs and XOs interviewed were very clear about their regard for these type of inspections. They were very glad to have an external, objective evaluation of their administrative management. "I like someone else to come in and take a look at my house. If it needs cleaning, sometimes they can tell me more than my own people." While there are some negative connotations about inspections, they are generally viewed as "a good but necessary evil." "Inspections can be adversarial. It all depends on the inspector. I think most captains really appreciate the honest evaluation and training that comes along with an inspection."

**6. Corrective Action**

Interviews contradict the theoretical attribute that correction of personal behavior is a component of compliance-oriented control. Policy makers believe there is little personal accountability for non-compliance. One interviewee

raised the example of a general property inspection. "When faced with a significant dollar error in property accountability, a unit is more likely to question procedures rather than discipline the property manager." Some policy makers felt this type of oversight perpetuates a system of personal non-accountability and encourages non-compliance.

After an inspection, the team reports areas of non-compliance to the unit's commanding officer and to the ship's immediate chain-of-command. Shipboard personnel do not attach particular significance to an inspection report's findings. If a negative report was felt to be unjustified or unworthy, then the offending requirement is either challenged or ignored once the inspectors leave. "I will have my people question those checklist items I agree are ridiculous. I won't necessarily spend my time arguing with the inspector, but I'm not afraid to write a letter. Sometimes, though, if the matter is not that critical, we just continue operating the way we did before."

The MLC inspection staff does not use these reports to correct process problems. "We really don't do analysis of systems here. Once a year, though, we compile a listing that reflects the year's most frequently-experienced problems and send it to the units so they can see the general weak areas." This list may or may not compel policy changes. One policy

maker noted that different ships operate under different supply systems. "Lessons learned would be important for the ships if they were all operating their supply departments the same. If all the ships were doing the same thing, then they could seek common solutions. I hear one thing from the Pacific Area and anther from the Atlantic and no common solution is possible."

**7. Rewards**

Theory states that extrinsic rewards reinforce behavior sought by a compliance control mechanism. The interviews support this view. When the inspection report team files its findings with the chain-of-command, the organization receives information about unit performance and an individual's management skills. While shipboard personnel admit the results show up as Officer Evaluation Report (OER) items, they believe the generally positive remarks help them and that negative remarks are inconsequential. "These reports are so much OER filler. I'm not sure that anybody really reads them anyway. Everyone, for the most part, comes away with an excellent or an outstanding (evaluation)." This seems to contradict the amount of work shipboard personnel perform prior to an inspection. The extensive work-up period indicates a desire to receive a positive report and avoid possible evaluation and promotion ramifications.

### 8. Feedback

Both compliance and TQM control systems require feedback channels to compel change. The compliance model suggests that system improvement should occur after inspection since top management must reconsider its policies. The Coast Guard's compliance program generally supports this view. While Headquarters and MLC encourage ships to submit procedural changes up the chain-of-command, compliance inspections represent the formal mechanism for organizational review of operational procedures.

The current inspection process is not designed to provide formal feedback to headquarters. Inspection teams report that they have no requirement to send their reports to Headquarters. "No, we don't send them (the reports) anywhere but to the unit and its immediate chain-of-command. I'm not sure headquarters would find them too useful anyway. The information seems pretty unit specific." Compliance inspection reports are generally not received and, therefore, not used by headquarters to identify systemic problems for CSS or other supply issues. A Headquarters policy maker stated, "I've recently seen one inspection report. I don't know how or why it got here, but one is not enough to work with."

Questionable areas identified during an inspection may or may not come to the attention of policy makers. Inspectors

are not required to seek clarification when there is a disagreement about rule interpretation. Depending on the personality of the inspector, the issue may never reach Headquarters. "We recently had an inspection where I disagreed with the inspector, he told me 'just follow the book.' I asked him if he was going to seek clarification and he said, 'It's not my job.'" Only through sporadic, individual efforts have problem areas been reported. Even then, shipboard personnel generate most of this feedback. "The issue was important enough to me for me to write a letter." The fact that they must seek redress on their own reinforces their feeling of isolation. "It just goes to show that no cares as much as you do about your job."

The interviews did indicate that inspections did provide a certain level of feedback to the commands. Most shipboard personnel stated that one of the primary benefits of inspections "is that they tell me how to do my job better. They also teach me about rules that I really didn't know existed." This type of feedback increases uniformity while simultaneously enhancing knowledge about the system's procedures. This form of learning, while different from innovation and adaptation, reinforces management's efforts to achieve its desired activities and results.

## B. SELF-CONTROL IN THE CSS ENVIRONMENT

To gauge support for internal control mechanisms as an alternative to compliance inspections, the interviews covered current self-monitoring procedures and TQM. The pick-and-choose CSS implementation method has left some gaps in self-monitoring, but ships are making real efforts to improve their systems. Reactions to TQM ranged across the spectrum of full support to loathing.

### 1. Goals and Objectives

A Total Quality approach to control would argue that goals and objectives should be defined by internal and external customers of the process. The interviews suggest that many people in the Coast Guard feel that they are involved in a very participative organization that allows people of all ranks to contribute to policy and process formulation.

In the CSS environment, supply personnel indicated that they felt they are more responsive to their internal customers than under the previous system. "My guys and I are part of the system now. We see what the parts are used for and understand why the engineers need them. I try to make sure they have everything they need." "If we break down and stay that way, its not the engineers' fault. We (storekeepers) are responsible for keeping this ship running

just as much as they are." As a result of this customer orientation, some ships have made the Special Item Management System (SIM) central to their response to onboard customer demands.

The lack of enforcement in the CSS environment has contributed to increased innovativeness and a greater orientation to customer requirements. Supply department personnel have felt free to adapt CSS procedures to better meet their customers' needs. "We didn't like the ASPM's receipt process. We changed it to reduce processing time and to get the technicians their parts as soon as possible." "The ASPM really doesn't have a good DLR (Depot Level Repairable) program, so we designed our own." These examples show how goals and objectives may be established by shipboard workers when they are focused on their internal and external customer demands.

Most interview respondents felt that the Coast Guard has long participated in TQM-like activities. Shipboard personnel felt that the close-knit working environment made 378s one big Natural Working Group. The physically confining structure and the operational demands make problem solving a natural imperative for ships. "We've always had to count on our people talking together. When you're on a ship, you've got to solve your problems or watch your mission fail."

TQM practices are not limited to ships, however. Even MLC and headquarter representatives felt that the Coast Guard has long depended on the ideas of junior personnel to ensure its operational success. Most officers stated that good officers had long practiced the inclusive practices of TQM. One officer stated, "TQM is just what good officers have always done and what bad officers will never do." Some Headquarters personnel noted that since TQM has become the management method of choice, "many of the high ranking people have become very receptive to comments from all sorts of people. I've seen some good changes come about because of this willingness to listen."

**2. Standards**

While the CSS environment is not controlled by a Total Quality system, it reflects the flexible attributes associated with TQM control theory. Interviews of supply department personnel revealed a need for flexible processes. While most of the supply departments felt that every ship in the fleet should be following the same procedures, they were not willing give up their own practices to increase standardization. "Yeah, I think its a good idea if everyone was doing the same thing. That way, when I get a new storekeeper, I wouldn't have to train him from ground zero. I don't think though that the procedures were designed with my job in mind. The ASPM

doesn't take into account my homeport or operational environments." The supply personnel felt that their operations reflected their particular working environments, personnel and operational schedules. Standardization, it appears, is a good idea for everybody else.

Procedural uniformity depends on stable processes. The Afloat Supply Procedures Manual (ASPM) conveys the CSS procedures headquarters would have its units follow. Most supply department personnel, however, consider the ASPM to serve as a guideline, not as orders. "I try to follow it as much as I can. I think I'm doing most of the things I need to be doing." Overall, the ASPM received poor ratings for its procedural guidance. In fact, some ships shelved the instruction in favor of its U.S. Navy antecedent. A number of shipboard personnel said "I don't even use the ASPM. I use the P-485, which is where the ASPM came from. There's no real difference." A couple of people even said "I'm an old timer. I prefer Volume III of the Comptroller's Manual. I can't find anything in the ASPM anyway."

Since the supply representatives consider the published rules inadequate, they used their innovativeness to improve their internal processes. Major tenets of CSS like mandatory allowances, mandatory usage of 1250-1 (a requisitioning document), and inventory accountability were

generally adhered to but not in the specific manner outlined by the instruction. "I don't use 1250s for all my requisitions. Its too paper intensive." "I don't like the filing system suggested by the ASPM. We do it differently." "We don't do SIM (Special Item Management) because its too time consuming and we really aren't there yet." "I run a manual inventory system parallel to SCAMP because it (SCAMP) doesn't do everything I need it to."

Bureaucratic management theory suggests that systems become more efficient as they become more standardized. These last few quotations indicate anything but standardization as the individual CSS units adapted the ASPM to their own environments. The interviews support the theory that innovativeness comes at the expense of overall system standardization.

**3. Behaviors and Activities**

The Afloat Supply Procedures Manual does provide the supply officer some self-control mechanisms for actively managing the ship's supply system. The ASPM concentrates on inventory control, usage data collection, and configuration management. A ship's use of these mechanisms seemed tied to the personality of the supply officers and the assistant supply officers. "If you want to see an effective supply system, make people work within the system. People don't

trust the supply system to be responsive. If a ship is getting underway or ready for deployment, and they need a part, they go and get it wherever they can." Interpretation of ASPM requirements, the ship's operational schedule and the length of time the ship has been out of FRAM are factors that determine which processes supply officers elect to follow.

Special Item Management (SIM) is a program that allows the supply officer to track usage of consumable items and parts. If the supply officer notes significant usage, the item may be added to inventory in quantities that reflect the usage rate. This program has great potential to increase sustainability and unit readiness. Many ships have elected not to perform this function or are performing it in a limited manner. "We haven't really got that far yet. I'm not sure its worth the time. I understand its a real time drain." The primary reason for non-compliance is that the program is a time consuming, manual process that would be accomplished better through automation. "If headquarters can't give me the software to do this job, then I don't see why I should do it." Some ships have created a SIM system using the outmoded, manual stock record cards. These particular ships, while increasing unit sustainability, suffer time management concerns due to maintaining both a manual and automated inventory systems. "My people are very busy. I have a hard

time keeping up my systems and giving the guys time for leave and personal business."

The interviews indicate that one area of successful internal control is inventory management. All the units report on-going accountability practices to increase part location/verification. There seems to be some confusion with the requirements for bulkhead-to-bulkhead inventory counts that has resulted in each ship establishing its own policy. "We do a bulkhead-to-bulkhead every patrol." "We haven't done a bulkhead-to-bulkhead. We think its absolutely absurd." "The people who thought of that requirement obviously didn't have anything better to do."

The addition and deletion of new and old parts due to equipment changes is sporadic at best. Many units reported inventories that had not been purged of old parts. "That's something we really haven't gotten to yet. I know it's important but I don't want to cut something that I may need later." One fear of deleting this stock is that the supply officers are not sure how the deletion of a part would impact support for other installed equipment. "Without a good CALMS document, I'm not sure what I am supposed to cut out or keep."

Self-control mechanisms and adherence to policy are weakened by demanding schedules and a perceived lack of oversight and support. As 378s exited FRAM, underwent a

rigorous Ready-For-Sea period and began normal operations, the supply department was hard-pressed to meet operational demands while simultaneously setting up new CSS processes. Added to these concerns are the ships on-going experiences with systemic problems which impact their supply performance: inaccurate allowance documents, shortfalls in inventory, and inadequate computer support. The interviews revealed that as pressure mounted, supply officers were very selective in their following of CSS procedures. "I know I was blowing off the ASPM, but I had a job to do. On top of that, there's just too much stuff in the book to comply with." As operational requirements became imperatives, supply departments did whatever was necessary to get the ship underway, including ignoring or changing regulations. "My job is to get this ship away from the pier. I'll try to do it within regulations but I'm not going to tell the captain we can't get underway because I didn't want to buy a part uptown."

This willingness to change procedures is attributable to another factor as well. The lack of compliance checks on CSS procedures left the supply officers free to alter their procedures and supply systems. "No one is checking CSS, which is a shame. But this allows me to do what I think is best for my own ship. I'm not too crazy about someone coming down here

anyway to tell me how I should run a system that was given to me already broken."

Most supply department interviewees felt the CSS procedures to be the most important and reflective of their daily activities. "Most of the stuff on the checklist, while important, is certainly not as important as what I do down in the storerooms. I just make sure I'm covered with the admin stuff on the checklist and do what I got to do." While happy on one hand not to be scrutinized too closely, supply officers were frustrated that the compliance inspections did not look at their inventory and allowance practices. "I've got over $7 million dollars worth of parts in inventory. Most of this ship's dollars are spent for spare parts but they only thing they care about are the small change dollars in commercial purchases." This statement indicates that even though there is no indication of poor internal control, supply representatives still desire some management oversight and that it be directed at aspects that have a more significant impact on readiness and sustainability issues.

**4. Results**

The assumptions of quality-based control mechanisms are that the desired results can be more readily attained through process focus, innovation and continuous improvement. The ability to innovate is encouraged by the system empowering

its workers to change their processes. The interviews did not reveal any information about continuous improvement but they did highlight an important source of shipboard innovation.

Supply departments felt free to change procedures locally because of a profound sense of isolation from "the system." The perceived lack of Headquarters/MLC response to issues raised at previous supply conferences lead supply departments to believe, "no one cares as much as I do about my problems." Aggravating this feeling is the perceived lack of shore-side support when the ship is on deployment. "The supply system is good but the Coast Guard's logistic's system is bad. There's no follow through. Headquarters does very little to assist with problems." This sense of isolation leads the ship to take the actions it believes necessary to accomplish its mission. If this mentality incurs some logistical inefficiency, the supply personnel felt that it is a small price to pay for operational success. "My job is to get this ship underway. If I have to spend some dollars outside of proper channels, who cares?"

**5. Measure and Evaluate**

While many people think that the Coast Guard has been "doing TQM" all along, they often forget about TQM's strong reliance on statistical data. None of the shipboard respondents, and most of the MLC/headquarters staff, reported

using statistical data in their management functions. When asked how they know they are doing a good job, policy makers and shipboard personnel responded, "I tell by the number of people screaming at me. The fewer, the better." "I go by a gut feeling. By walking around, watching, observing and talking to my people, I get an idea of how things are going."

Self-measurement is fundamental to self-control. Shipboard interviewees revealed a grudging acceptance of this principle. When asked if they would use statistics, most agreed that data was important but was too difficult and time consuming to collect. Shipboard personnel were quick to ward off any attempt to place yet another demand on their very scarce time resources. "I don't have time for that stuff. Besides what do numbers like 94% and 95% mean to me. My people and I should be able to come up with good solutions without using detailed statistics."

While most respondents liked the philosophy associated with TQM, they felt that its processes were counter-productive. "I hate the hoopla behind TQM. It's only good basic leadership skills. People are just jumping on the TQM bandwagon while they should have been doing it all along." "We have TQM meetings about TQM. Seems pretty silly to me." "TQM is a good movement, but it's taken on a life of its own which is unfortunate." "The Coast Guard will never make TQM

work, because they are only willing to pick some of Deming's 14 points. If TQM is going to be effective, all TQM points must be used and not just the ones you want." The wide range of statements indicates that TQM and its processes are an emotional issue for many people.

**6. Feedback**

Previous sections have shown how CSS ships increased innovation in response to their demanding operational schedules and their feelings of self-control. Each ship improved its internal system but did not pass on its changes to other ships or to policy makers. The interviews revealed that supply personnel did not actively seek the improvements of others nor did they actively let policy makers know of their own improvements. "If another supply officer called me, I would tell him what I am doing. I wouldn't call him first, though. There's a certain amount of professional pride and I wouldn't want the other guy to think I was being pushy."

Most supply officers listed two other reasons for this breakdown in information flow. They stated that a sense of independence from other vessels and the lack of an informal "lessons learned" mechanism led to their complacency. Busy operational schedules and different environmental factors (personnel, operating areas, and time since FRAM) led supply officers to think their units were unique. All the supply

department representatives stated that an informal, non-time consuming "lessons learned" mechanism would have provided them an opportunity to share their improvements. "If there was some way that I could pick up the phone, use E-mail, or even just write a quick note, I would be inclined to talk about my ship's improvements. I don't want to draft a formal letter; have my CO edit it and I don't even want to think about the benie sug (beneficial suggestion) program." The lack of an adequate feedback mechanism has limited the diffusion of unit-level innovativeness throughout the fleet. Systemic learning is reduced by the inability of shipboard personnel to inform others of their improvements.

The supply representatives felt that the supply conferences provided a forum for policy makers to hear their complaints, but more importantly, it provided them an opportunity to talk with their contemporaries about various supply issues. "I liked the conferences. The chance to sit down in an unhurried environment, just to talk supply stuff, was pretty good."

The ASPM, representing the areas of headquarter's emphasis, also impacts organizational learning. When headquarters first published the ASPM, fleet representatives reviewed it and proposed changes. Since its distribution, the ASPM has remained largely unchanged. "Ships find the

publication change process too formal and time consuming. Additionally, new people now fill the CSS policy billets." These new policy makers, charged with ASPM review and rewrite, have not visited any 378s and are unaware of the fleet's operating environment. This lack of information can only hamper the organization's ability to learn and improve.

**7. Corrective Action**

The interview data did not support or oppose the theoretical assertions about TQM and corrective actions. The CSS environment does not include a systematic method for process improvement. Ships do not use a FADE process or statistical collection methods. Any changes made to the system were made using a "MBWA (Management By Wandering Around) process. I see things going not as well as they could, and my guys tell me things to improve the system. We get together and come up with a better way to do things." This ad hoc process does not present a view of a Quality control system. A TQM approach insists that any change, to be a good change, must be supported by statistical data and not by "gut feelings." Ad hoc changes may result in greater wastage and reduced effectiveness.

**8. Rewards**

The theoretical attribute for the rewards component is that a TQM control system would provide intrinsic rewards for

its participants. The interviews support this hypothesis. Shipboard personnel expressed a great amount of professional pride in improving their ships despite the adversities of the CSS environment. Supply representatives pointed out improved inventory practices, increased sustainability and a profound sense of accomplishment in making a poorly implemented system work. "This ship has never missed a sail date due to a supply problem. While, I don't have the hard data to support this, I know that my inventory has improved our sustainability while underway." "None of the other ships can match our inventory location-verification record." "Our ship has the best SIM program around." "Our efforts have identified an incredible shortfall in ordnance parts. Once we get them, the ship will benefit for a long time to come."

This sense of professionalism, however, also creates deep frustration. Supply department personnel feel they lack the ability to change the system and must work around its weaknesses. "Until I'm told to stop, or until I receive the tools I need to do this job properly, I will continue to run my department the way I see fit. That way I know the ship will get to where it needs to go."

## C. OTHER FINDINGS

We thought it would be interesting to identify what the fleet considers the supply system's weakest areas. At the end of each interview, the respondent was asked to identify and rank three supply areas that needed improvement. In collating the votes, two items tied for second place. The following list, therefore, presents the four "winning" problems in order of priority.

- an integrated, automated supply system that combines inventory, requisitioning, usage and status tracking, property and budgetary requirements
- an up-to-date, accurate CALMS document reflective of onboard equipment
- adequate, timely training for everyone involved with the supply system, including but not limited to supply department personnel, technicians and command staff
- responsive shore-side support in homeport and at sea

Most of the issues raised were outside the cutter's ability to resolve. Policy makers are aware of most of these issues and are seeking long-term solutions to these complicated problems. Operational demands, however, have cutters seeking their own solutions.

## D. SUMMARY

What the interviews have revealed is a CSS system that is driven more by force of personality than by process control systems. Coast Guard culture encourages this and current control design does not preclude it. The Coast Guard's encouragement of personal initiative increases innovation and learning but decreases efficiency and procedural uniformity.

The interview data indicates limited correlation between the theoretical attributes of a compliance control system and the Coast Guard's inspection program. While policy makers write detailed instructions, fleet personnel tend to treat them more like guidelines than mandates. The inspection checklists, however, reinforce the system's focus on end-products (i.e., documentation) and are used by ships and inspectors alike to ensure procedural uniformity. The Coast Guard's inspections lack a serious enforcement mechanism. Weak personal accountability decreases conformance. The Coast Guard's program, due to its detection orientation, creates a time lag between improvements. While ships do not care for the adversarial nature of inspections they do like the external evaluation of their shipboard systems.

Internal control mechanisms have met with limited success. Operational demands and subjective opinions have compelled supply officers not to comply with otherwise beneficial

procedures. The lack of inspection oversight, coupled with high-pressure operational demands, has encouraged supply department adaptation of CSS procedures and enhanced supplier/customer relationships. The supply officers' ability to innovate, however, has reduced overall procedural uniformity and created logistical inefficiencies. Most shipboard personnel felt that a Total Quality environment existed naturally within the confines of their ships' hulls. The majority willingly accepts the management philosophy but expresses reluctance to adopt TQM's dependence on meetings and statistical data.

Feedback between levels of command and between various vessels is sporadic and informal. Information indicating needed changes is left at the wrong level. Compliance teams do not routinely forward their findings to the policy level, and ships do not request policy changes because of the time consuming, non-responsive nature of the formal system. Furthermore, compliance inspections create a feedback delay at the unit level due to their infrequency. Self-control mechanisms, on the other hand, have increased feedback at the unit level due to their enhanced customer/supplier

relationships. What improvements are made because of this heightened awareness, though, tend to remain within the confines of the innovative cutter. Ships are slow to spread the word about their improvements to other vessels due to their perceived isolation. In the unlikely event that improvements are diffused throughout the system, it is on an informal and infrequent basis. Seemingly, what little innovation occurs is not because of the system but in spite of it.

# VI. CONCLUSIONS AND RECOMMENDATIONS

This chapter addresses the research questions posed at the beginning of the thesis: (1) What are the merits of TQM and compliance-oriented inspections as control systems for effective CSS operations?; (2) What is the current state of compliance inspections aboard CSS cutters?; and (3) How could TQM support a self-control mechanism aboard CSS vessels?. Chapters IV and V began our discussion of the merits of compliance and self-control systems as seen in theory and as experienced by the fleet. Chapter VI, therefore, focuses on completing the comparative analysis and responding to the remaining issues of TQM's possible impact on self-control capabilities of CSS cutters. The chapter summarizes our comparison by drawing the diverse information together to present the strengths and weaknesses associated with each type of control.

Then, Chapter VI looks at how a Total Quality approach to control could support CSS operations. The chapter and thesis concludes with a series of recommendations about current practices and areas for additional research.

## A. MERITS OF COMPLIANCE-ORIENTED CONTROL

The advantages and disadvantages of compliance inspections are outlined using the basic components of control as a framework for discussion. Bureaucratic organizations use compliance-oriented mechanisms to invest and reinforce their authority over goal definition, rule standardization and worker behavior. These actions lead to advantages of increased efficiency, greater management control over goal definition, increased behavioral alignment with management's goals, and increased standardization through top-down feedback. These advantages are discussed in greater detail in the following sections.

After considering its strengths, the limitations associated with compliance inspections are presented. Top management's complete control over the organization, while increasing uniformity, does present some problems in planning and adaptability. The disadvantages of decreased innovativeness, increased planning inconsistencies and the lack of continuous improvement are attributable to compliance-oriented systems.

### 1. Advantages

Compliance inspections can offer significant advantages to bureaucratic organizations. Chapters IV and V showed how these benefits evidence themselves in theory and in

practice. The foremost benefit an organization can obtain is increased efficiency in meeting its legal and self-imposed requirements. The bureaucratic organization can also hope to reinforce its hierarchical character through its control mechanism.

*a. Increased Efficiency*

Compliance inspections increase efficiency by ensuring procedures are followed uniformly throughout the organization. Large organizations that have numerous, complex processes search for a means to make their sub-units work as cohesively as possible to the greater good of the entire organization. Standardization also allows top management to minimize variance in performance at the sub-unit level. This procedural uniformity allows top management to feel more secure about their ability to meet their legal obligations.

The Coast Guard has a large number of diverse federal regulations for which it is responsible. With Headquarters establishing and enforcing policy, it can confidently report to Congress its efficient management of public resources. Through compliance inspections, the Coast Guard maintains control over its far-flung units, all which have multiple regulatory responsibilities. By establishing well-defined procedures and then ensuring units follow them,

Coast Guard Headquarters increases its confidence in meeting its legal requirements.

Centralized supply was implemented by the Coast Guard, in part, because of wide variations in the management of cutter inventories. Shipboard storerooms represented to Headquarters and Congress dollars spent but not actively managed. Cutter sustainability and readiness issues reflected the wide variations in the cutters' performances of their supply support missions. Strict compliance inspections of CSS cutters would reaffirm Headquarter's control over supply support issues and decrease fleet-wide deviations from procedural requirements. The interviews have indicated that without inspections CSS cutters have shown a tendency to modify or ignore Headquarter's supply policy in favor of their own agendas.

***b. Increased Management Control Over Goal Definition***

Compliance inspections reinforce a bureaucracy's hierarchical structure. As earlier analysis indicates, in a compliance-oriented regime, policy is the purview of top management. Once policy is established, top management has a vested interest in seeing it enforced. In and of itself, the act of issuing policy reaffirms to the rest of the organization the preeminence of top management. Likewise, the

act of inspection reinforces the fact that headquarters is in control of its subordinate units.

In the case of CSS cutters, the lack of inspections gave implied consent to the supply departments to revise management's reform agenda. As different processes were ignored or modified, the authority of policy makers diminished. While Headquarters may believe that its published policies are correcting past mistakes, it lacks consistency of effort because each field unit is rewriting the ASPM's procedures to meet local needs. A strict compliance mechanism, however, would realign such inconsistent activities and behaviors, thus reasserting Headquarter's role in defining the shape of supply support processes aboard its High Endurance Cutters.

*c. Increased Behavioral Alignment with Goals*

Compliance inspections are designed not only to satisfy legal requirements but also to align personal behavior with management's goals. The chain-of-command benefits from inspections through the evaluation of its units and individuals. Inspection results are used as an indicator of an individual's or unit's performance. These evaluations allow the organization to cull out its non-conforming members. In this manner, the system seeks to safeguard current

efficiency standards and to improve future efficiencies by keeping only those members who comply with regulations.

If compliance inspections accurately report the state of supply department operations, the organization could easily identify those individuals complying with regulations. These people would be rewarded with positive marks on their evaluation reports and their chances for future promotions would increase. Non-conformists would also be identified and given negative marks on their evaluations to decrease the likelihood of future promotion or retention. As described in Chapter V, shipboard interviewees felt that current evaluations did not reflect their performances in lieu of their CSS responsibilities. As such, Headquarters can not use compliance inspections to motivate certain behaviors to promote uniformity in CSS procedures.

As the interviews showed, while shipboard personnel expressed a certain nonchalance about the impact of inspections on their personal evaluations, their actions belied their comments. Most individuals wanted to perform well on the inspection as shown by the ships' work-up periods before inspections. Headquarters could easily encourage this type of attention to procedures through a strict enforcement and reporting process. By controlling and reinforcing desired

behavior, Headquarters assures itself of meeting its overall objectives.

*d. Top-Down Feedback Increases Standardization*

Compliance inspections present an opportunity for policy makers to restate their requirements for subordinate units. When inspectors tell errant individuals what policy states and then show them how to comply with it, the organization enhances its standardization efforts. Top management gains increased adherence to its directives, and individuals gain an understanding of their role within the organization.

Shipboard personnel see this feedback as a type of training. It allows them to learn how to work within the system. Feedback increases the individual's ability to perform procedures properly and to become better managers.

This management-generated feedback also provides the organization with significant reductions in fleet training requirements. Standardization of procedures allow individuals to move from unit to unit without additional training. If procedures are uniform, individuals can begin their new job in a new location without any loss to learning curve efficiencies. This decrease in organizational training saves time, effort, and money, and it raises unit operational readiness. By ensuring procedural uniformity, management

avoids having to provide additional training to acquaint members with a large number of different systems.

The interviews showed significant fleet support for the feedback/training aspect of inspections. Without exception, every manager spoke of the benefit to the entire organization, the ship, and the individual when inspections concentrated on its training aspects. This training is nothing more than a reassertion of management-held positions on policy and procedure. The Coast Guard can increase procedural uniformity by providing on-site feedback during its inspections.

**2. Disadvantages**

Compliance inspections may bring with them significant disadvantages. While they increase efficiency, they decrease innovativeness. Also, inspections require top-down establishment of policy which serves to create inconsistencies in planning. The detection orientation of inspections leads to peaks and valleys in performance, which is contradictory to continuous process improvement recently sought by the Coast Guard. Finally, the inspection process itself often proves counter-productive as the organization attempts to meet its strategic goals.

*a. Uniformity Decreases Innovativeness*

As bureaucracies strive to become more efficient, they tend to standardize as many procedures as possible. This process reduces innovativeness.

> Routinization reduces organizational adaptability for a number of reasons. First, it precludes innovative acts from those whose work is routinized. In addition, it tends to ossify the organization because when there is a high level of interdependence between various work routines, changing one means that many others must be changed as well. Finally, people develop loyalties to some routines which makes it all the more difficult to change the routines when necessary. (Bushe, 1989, p. 26)

Compliance inspections institutionalize this process of standardization. As inspectors identify areas of non-conformance, they bring the errant unit back in line with training or with a negative report. As the above quotation states, such routinization reduces innovation.

In the Coast Guard's case, this assertion proves out. For those areas that have long been inspected, units tended to work at a level below the inspection standard. While people felt they could go beyond the standards if they wanted to, they rarely did. Time constraints, brought on by hectic operational schedules and numerous, external demands, deterred shipboard improvements.

The interview data validates the connection between innovativeness and inspections. Where inspections were lacking (e.g., the CSS environment), supply department

personnel professed a sense of freedom to make changes and improve the supply system. These changes resulted in streamlined filing, receipt and inventory procedures.

*b. Increased Planning Inconsistencies*

As control theory indicates, compliance inspections are designed to enforce top management's policies. The knowledge required to define near-perfect policies and procedures is difficult to obtain. When upper management presumes to have all the answers, organizations suffer because of a lack of knowledge.

> There are some problems with planning from the top as the key adaptation mechanism. First, when organizational members aren't involved in the planning, it creates resistance to implementation. Planning from the top has its own inefficiencies in that it does not use the talent and knowledge of employees who are working at the boundaries of the organization. (Bushe, 1989, p. 27)

A good example of this lack of worker participation was brought up during the interviews. The Afloat Supply Procedures Manual, while originally edited by some of its users, is considered by many shipboard personnel to be unresponsive to their needs or operations. The lack of additional editing or input by shipboard members increased the feelings of supply representatives that the ASPM was management's tool and a poor one at that.

The Navy's research into inspections provides another example of how planning goes awry due to inspections.

"A particular problem noted (with inspections) was the burden imposed by the fact that a specific or unique problem at one command or unit often results in the application of corrective actions throughout the fleet." (Naval Reserve DET 420, 1992, p. 16) When top management senses a problem, it may over-react by imposing new requirements without sufficient evidence to support such an action. In the Coast Guard's case, supply procedures reflect this tendency to over-regulate. A couple of supply examples include letters-to-file requirements (i.e., authorized procurement officials) and signature-to-file requirements (i.e., signatures on certain inventory documents to maintain individual accountability). These type of requirements place an undue, administrative burden on units and only satisfy the need for determining personal accountability when problems arise. This need to identify problems with persons rather than with processes is inherent to the normative assumptions associated with compliance inspections. Rigorous planning and strict, procedural requirements are endemic to a system that does not trust its workers to perform to a certain standard.

*c. Impedes Continuous Improvement*

The very existence of compliance inspections goes against the continuous improvement process advocated by TQM. When the U.S. Navy compared their own inspection programs

against their Total Quality Leadership (TQL) initiative, the report stated

> The inspection program is one area that appears to contradict TQL, notably, Dr. Deming's Point #3, "cease dependence on mass inspections." This is based on the precept that quality results from improving the process rather than from using inspections to identify defects. (Naval Reserve DET 420, 1992, p. 1)

This product-focus, when coupled with management's sole control over process correction, deters continuous improvement.

*(1) Detection Causes Time-Late Improvements*

Chapter IV shows how compliance inspections are detection-oriented. Quality assurance does not occur until after the process has been completed. Since the process is already finished, inspectors are only able to examine the process' paper trail. Most compliance inspections are designed to catch documentation errors rather than policy problems. Once enough inspections are done, a number of similar documentation errors may lead to some process improvement. This time-late correction process implies delay in improvement is acceptable. Even if inspections were designed to discover policy flaws, they are infrequent and would inherently delay improvements.

Figure 7 shows how improvements occur when poor procedures go undetected or unchanged. Inspections result in leaps of improvement. "Management seeks performance improvement only when a crisis occurs or when performance has slipped so low it becomes obvious something needs to be done." (Sink, 1989, p. 132)

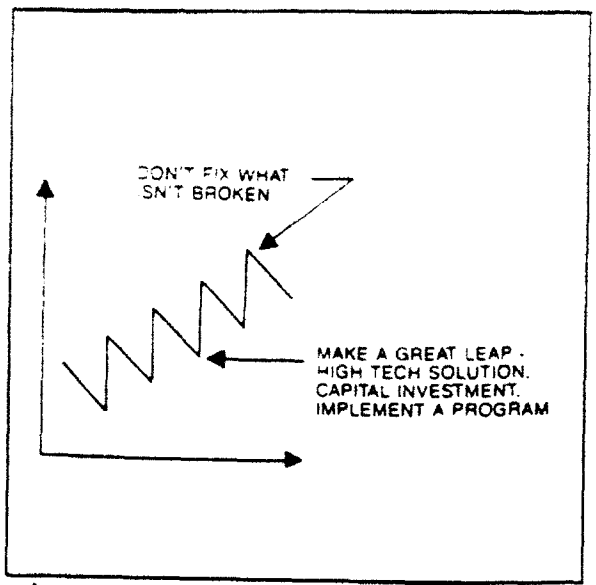



**Figure 7 Performance and Detection-Oriented Control**

In the Coast Guard's case, this time delay may reveal itself on two different levels. At the unit level, inspections are only conducted on a biennial basis. Ships may operate incorrectly for two years prior to correction. At the organizational level, until a significant number of reports indicate a policy or process failure, procedures are left in place that are themselves contributory to ineffectiveness.

*(2) Reduced Feedback Slows Improvement Cycle*

Top management's control over policy also adds to these cyclic leaps of improvement. "In efficient organizations, adaptation is driven by strategic changes made

at the top, and it requires long planning cycles and lead times." (Bushe, 1989, p. 26)

In this case, Coast Guard Headquarter's control over policy also creates time delays in improvement. Policy makers are captive to the flow of information about needed change. They must first hear from the field about a needed change before beginning their policy review process. Even then, changes may take longer than the fleet believes is reasonable. An excellent example is provided in Appendix C in the form of the supply conference notes. The interviews indicated frustration in the fleet about management's perceived lack of action. The interviews also indicated that process problems are not necessarily reported by inspection team members. Shipboard personnel, if they feel strongly about the matter, must deal with a cumbersome feedback mechanism to alert policy makers about their concerns. Even if information does make its way to the policy level, the field's performance continues to decline as Headquarters deliberates the matter.

**3. Current Inspection Program Dysfunctional**

While theory tells how an organization can benefit from a compliance-oriented control system, theoretical results depend on ideal conditions and responses. By understanding the current state of inspections aboard CSS cutters (one of

the research questions), we are able to judge these theoretical merits against actual application.

Chapter V presented detailed information on how compliance inspections are viewed on CSS cutters. For the most part, compliance inspections do ensure a level of procedural uniformity; however, this uniformity is encouraged not by strong enforcement methods but by individual acceptance of policy guidance. This reliance on individual professionalism suggests that the Coast Guard's organizational philosophy is more reflective of the normative assumptions of self-control than those of compliance inspections.

The lack of strong oversight has created an environment of selective self-enforcement on board the ships. For those procedures that are part of the checklist review, the interviews indicated general compliance with some selectivity on the part of various commands. For CSS requirements, which are not covered by current checklists, there was wholesale modification or rejection of Headquarter policy. The lack of enforcement, coupled with individual initiative and a strong desire to accomplish unit missions, have led to variation in process performance and increased unit adaptability.

Our research supports the U.S. Navy's review of their own inspection program, conducted in light of their Total Quality Leadership initiative. Figure 8 schematically represents the Navy's findings. Their research indicates that inspections have become dysfunctional over time because of four major factors: culture, process, organization and training. These four components represent the major defining issues for their inspection program.

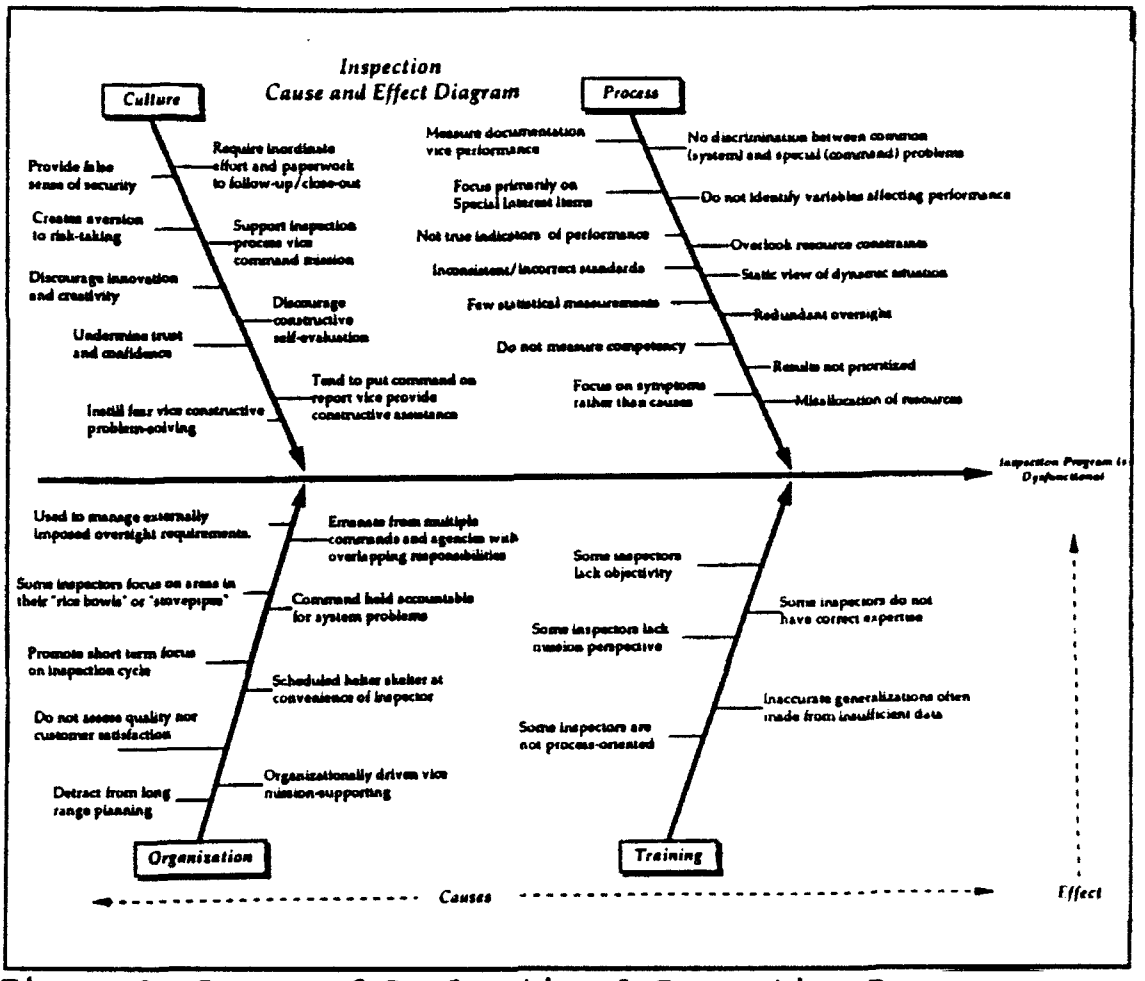



**Figure 8 Causes of Dysfunctional Inspection Program**
(Source: Naval Reserve DET 420, 1992, p. 27)

The Navy's research concludes that inspections have become dysfunctional and are not in keeping with their continuous improvement goals.

> The area we believe is most important from a management standpoint is the distortion induced by the inspection process itself and inspection cycle. The other areas can generally be fixed, but the periodicity of inspections inevitably produces the peaks and valleys which are contrary to the continuous improvement process of TQL and, in our judgement, represent a fatal flaw in the inspection process...In the area of Culture: We observed that the reliance on inspections verges on addiction. You just have to have one and then another. They certainly impede not only free communications between superior and subordinate but also discourage constructive problem solving. They tend to focus attention on the narrow issue of passing the inspection rather than the broader goal of improving performance...In the area of Training: All too often the inspectors lack a balanced perspective and do not have an adequate appreciation of the impact their area has on the commands ability to perform its mission. (Naval Reserve DET 420, 1992, p. 28-30)

The Navy research recommended a phase-out of compliance inspections and a slow implementation of management oversight programs using TQL processes. Our research does not seek to provide any such recommendation, rather we aim to highlight the strengths and weaknesses the two different control philosophies represent.

Our research supports many of the Navy's findings. The interviews indicated that Coast Guard inspections are troubled by many of the same cultural, procedural, organizational and training factors that impact the Navy's program. The following examples highlight a few of these

similarities. Cultural: Data supports the connection between inspections and innovativeness; the stricter the inspection, the less innovation the organization experiences. Also, interviews with supply personnel indicated a sense that inspections were more concerned with inspection criteria vice mission-related goals. Process: The interviews showed that compliance inspections tend to look at after-the-fact products (e.g., documentation) versus actual performance. Furthermore, the inspection team did not focus on critical, readiness-related processes. Organization: The work-up periods experienced prior to inspections creates infrequent, short-term fixes rather than a continuous improvement cycle. Also, most of the inspection items are management-driven versus operationally related. Training: The interviews suggested that some inspectors were unconcerned with process improvement and that not all inspectors were capable of providing insightful training to the commands due to their lack of experience. Our study, in combination with earlier findings, clearly indicates that compliance inspections have become dysfunctional and are contrary to continuous improvement and increased innovativeness.

## B. SELF-CONTROL SYSTEM

So that our comparison is complete, this section discusses the merits of self-control processes. It also responds to the question of how TQM supports self-control. Since the Coast Guard cutters are not operating a self-control mechanism, the following sections use other research studies to support our analysis. Where possible, we use interview data to support our conclusions.

### 1. Advantages

A number of advantages accrue to self-control mechanisms. Self-control increases innovation through increased worker participation in the system processes. The ongoing measurements and worker involvement produces a stream of continuous improvement. Process refinements are cultivated by a customer focus that leads to improved operations and increased productivity.

#### *a. Increased Innovativeness*

Self-control is based on a philosophy that assumes people want to perform their very best at all times. This assumption allows the organization to trust its workers with the management of its processes. Since workers are closer to the processes than management, they are in a better position

to track conformance and determine possible improvements to the system.

In the case of CSS cutters, we see a self-control mechanism that has been established by default. The interviews showed how the cutters experimented with the various processes found in the Afloat Supply Procedures Manual. Cutter personnel adapted these procedures to fit their particular personalities and working environments. Each ship indicated different areas of process improvement, for example inventory control, Special Item Management, and configuration control. Personal initiative and innovativeness flourish on CSS cutters due, in part, to the absence of formal inspections.

*b. Improved Operations*

By identifying external and internal customer requirements, a Total Quality system improves its processes and its final products. Chapter III discussed TQA's customer focus. By empowering workers to control their processes, beneficiaries up and down the process chain are able to participate in improving operations.

Coast Guard cutters are in the business of getting underway. Almost every shipboard person interviewed indicated that "getting the right part at the right time" was crucial to successful operations. A Total Quality program of self-

control would monitor the responsiveness of the supply system to customer demands.

> Responsiveness is the primary measure of effectiveness for the logistics system. An effective system delivers required materials to the customer/user within established time frames...As for the Commanding Officers, a response-oriented supply system does not interfere with any of their initiatives or decisions. It gives them and their staffs an opportunity to direct initiatives and focus decision-making on resolving operational mission issues rather than spending time and energy dealing with the daily problems of a non-responsive supply system. (LMI, 1988, p. I-5)

As the above quotation indicates, customer-focused operations allow floating units to direct their efforts toward operational versus support issues. By monitoring demand usage and the passage of time from request to delivery, the entire chain from supplier to customer (item manager to ship) can benefit. These data allow suppliers and customers to analyze and improve their requisitioning and delivery systems. The interviews characterized shipboard operations as improved due to an increased focus on internal customer demands. While statistical data is not available, interviewees asserted that the enhanced supplier/customer relationship improved parts availability that, in turn, resulted in increased sustainability.

*c. Continuous Process Improvement*

Chapter IV shows how self-control mechanisms are prevention-oriented. Quality assurance occurs at all phases

of production, especially during the process. The significant advantage of self-control over compliance inspections is the continuous monitoring of the system's processes. This type of control is designed to catch process errors prior to end of its production cycle. In this way, defective end-products are avoided and faulty processes are identified and corrected.

> Continuous improvement strategies focus on performing better tomorrow than today. They involve different management processes and practices, and tend to have a steeper improvement slope over the long run than step-function strategies. They require everyone, at all levels, to be involved in the improvement process. (Sink, 1989, p. 133)

Figure 9 shows how improvements occur when inadequate procedures are detected before the end of the process. Self-control's continuous monitoring creates a flow of information that is used to provide steady improvements to the overall system. When compared to the compliance-associated "great leap" improvements seen in Figure 7 (page 127), Figure 9 shows how self-control is capable of a higher, more constant level of performance over time.

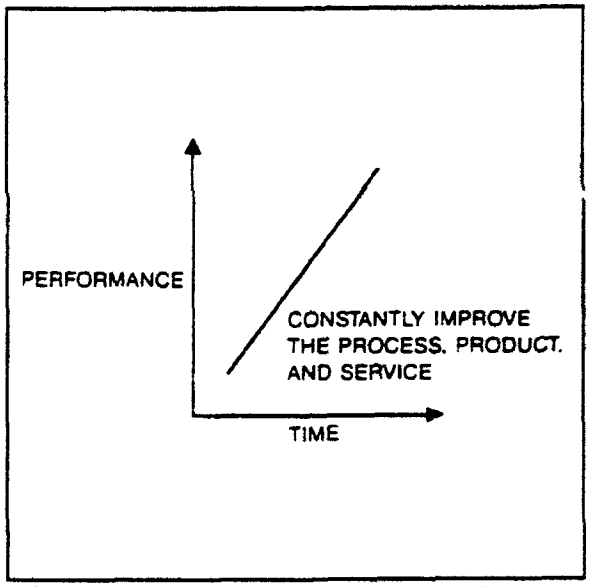



**Figure 9 Performance and Continuous Improvement**

### 2. Disadvantages

Bureaucratic organizations often face a number of difficulties when adopting a self-control mechanism. A Total Quality approach is heavily dependent on statistics for process improvement. This dependence creates problems in data gathering and in evaluation. Furthermore, a bureaucratic organization like the Coast Guard faces some difficult issues when it tries to switch from a hierarchical to a participative management structure.

#### *a. Problems with Statistics*

A number of issues plague an organization that depends on statistics. Because CSS vessels are not currently using statistics, they are not experiencing problems with data collection and evaluation. Nevertheless, those interviewed stated that they would use them if they were easy to obtain and to interpret. As the following sections show, when an organization starts to use statistics, it must be concerned with methods of collection and evaluation.

##### *(1) Problems in Collection*

Establishing appropriate measures of effectiveness that focus on performance versus interim products (e.g., paper work) is very difficult. The "who and how" of data collection are very complex questions that have been erroneously answered in the past.

> The deficiencies in output measures include insufficiencies in the techniques for performance measurement, problems in the quantity and quality of routinely collected data, lack of staff capacities and expertise in productivity measurement, too little attention to performance measurement, and organizational constraints such as inconsistent data collection and analysis methods. (Gortner, 1989, p. 211)

The interviews revealed that shipboard management is constrained by a lack of training in the collection and evaluation of measurements and by the lack of adequate, automated collection devices.

*(2) Misuse of Statistics*

Even though organizations may go through great efforts to collect data, they may be making these efforts for reasons that do not support their goals for quality improvement.

> Although measurements are important, they have some limitations. Measurements can become ends in themselves. Another common pitfall is the tendency to over-measure. The infatuation with academic analytical techniques, the advent and proliferation of computer technology, and management's traditional desire to control has led many companies to overemphasize measurements. Some companies have gotten so bogged down in analysis and measurements that they have make little progress with their productivity and quality efforts. Too much stress on measurements has also been a cause of worker mistrust and alienation because in the past management has too often used measurements to control and punish people. (Metz, 1987, p. 2-6)

The Coast Guard should be clear about the purposes of its data collection. Self-control mechanisms are not designed to measure people but processes. Self-control mechanisms,

however, may be less susceptible than compliance-oriented systems to data collection and evaluation problems. In a self-monitoring system, the measuring and evaluation functions would be carried out by the people involved in the work itself.

As the quotation also indicates, the Coast Guard should not gather statistics for the sake of measuring alone. Statistics must serve the quality goals of the organization. In this case, the Coast Guard must look for statistics that measure the performance of its supply system and not just seek reassurance of the fleet's conformance to published procedures.

***b. Evaluation Problems***

Research shows that just because an organization collects statistics it does not necessarily use them to the benefit of its quality goals.

> There are serious questions about whether evaluation results are, in fact, well used. There may be controversy over research design and data interpretation. Other impediments to both the conduct and use of evaluations derive from fears of program managers or advocates that evaluations will result in the loss of autonomy of funds or program authority. The possibility that evaluations will be used to justify political support or opposition by outside groups is another source of tension. (Gortner, 1989, p. 212)

Statistics may not reveal pleasant facts to the data analyzers. As the quotation states, statistics may threaten

the organization or some of its sub-units if the data reflects negatively on the system.

There is always concern about data manipulation. The old saying is often raised when discussing the use of statistics to support a certain political stance. "Liars figure and figures lie." The ability to define measures of effectiveness and method of collection may lead to certain distortions in evaluation. Even in a self-control system, management maintains a heavy influence over the definition of statistical standards. Policy makers should consult with the workers involved in the process to avoid unnecessary measurements and improper evaluations.

*c. Bureaucratic Character of Organization*

The bureaucratic character of the Coast Guard may diminish the effectiveness of a self-control mechanism. The bureaucratic tendency to hold meetings, to require reports and to provide information up-the-chain of command may undermine the local perspective of self-control. The interviews indicated some concern that "TQM is just another managerial fad," and that the "hoopla" associated with it would over-run the practicality of the program. A major challenge to bureaucratic organizations shifting to Total Quality is the power sharing and decision authority that is required by systems engaged in continuous improvement and self-control.

To the extent that organizational members do not truly believe this degree of change is being made by those in high authority, this type of skepticism will interfere with the success of Total Quality efforts.

*d. Forces Resistant to TQM*

The ability to implement a self-control mechanism, after depending on compliance inspections for so long, requires management to deal with a large number of forces resistant to change. In a general listing these opposing forces include "uncertainty, reward systems, work loads, current paradigm, resource limitations, and threats to powerful coalitions." (Williams, 1991, p. 74)

A previous study identified specific forces resistant to the Coast Guard's implementation of TQM.

> Dozens of anticipated barriers to TQM have been voiced at various ODI training courses. The top five perceived impediments to TQM working in the Coast Guard are listed: (1) Perception that senior officers really aren't "participating" in TQM. (2) Who gets the savings from TQM? The concern here is that when a unit improves processes and saves money their budget is reduced. (3) Our Coast Guard culture - the customary way of doing business is not compatible with the TQM methods. (4) Stovepipes - the lack of cross-functional awareness of the Quality philosophy. (5) Unrealistic expectations - a drive for short term solutions and payoffs with TQM. (Williams, 1991, p. 92)

The interviews support this previous study's findings. Chapter V revealed that most interviewees questioned management's commitment to TQM over the long term. The

interviews also suggested that the Coast Guard's military culture when combined with its hierarchical structure may present obstacles to acceptance of TQM as a viable management philosophy.

## C. OBSERVATIONS

Over the past five chapters of this thesis, we have confined ourselves to reporting theory and interview data. The following section allows us to meld our research into a vision of the future, where the better qualities of both control systems may be joined to further Coast Guard interests. Our observations pertain to the present state of control over CSS functions, TQM in the Coast Guard, and our vision how the Coast Guard would implement a self-control system aboard its High Endurance Cutters.

### 1. CSS and the Present State of Control

The current compliance system does not provide adequate control over CSS functions. Checklists exclude CSS procedures and storerooms go unchecked. Policy makers do not receive feedback about the quality of ASPM processes through the formal control system but, instead, through infrequent supply conferences that, to date, have served to increase the perception that the logistics chain-of-command is unable to resolve longstanding supply problems.

It is too early to discuss the MLCs' recently established CSS teams as an effective control mechanism. First impressions, however, indicate that these teams will not provide sufficient control over shipboard processes. These CSS teams do not have a mission statement that is consistent with control. Both teams see their primary function as training. While training may increase awareness of ASPM requirements, it does not necessarily compel conformance. If policy makers are looking for standardized performance, these teams lack enforcement capability and tend to be less directive because of their training mission. The teams, however, do increase feedback from ships to policy makers and may lead to corrections of longstanding problems in the ASPM.

While ships have continued to sail and their missions have been accomplished, this has mainly been achieved by the force of personalities aboard the various cutters. The level of commitment to CSS is a function of the complex interplay between the command staff and the supply officer and the assistant supply officer. Most supply officers and their subordinates have tried to live up to the practices and the spirit of CSS. It is our feeling, though, that the supply system is slowly returning to the fragmented, inefficient structure CSS was designed to correct (e.g., poor inventory control, off-line requisitioning, and poor configuration

management). A system built on force of personality, and not on stable processes, can not withstand the forces of time: personnel constantly changing, increasing tempo of operations and supply rules adapted more and more to local conditions and local personalities.

We agree with the interviewees who stated that the most important supply functions are now represented by CSS procedures. We believe it is in the Coast Guard's best interests to establish a control mechanism that takes advantage of the strengths of the studied control systems. The Coast Guard has spent a lot of time, money and effort implementing CSS on its ships. It makes good sense to protect that investment through a well-devised control system.

**2. Total Quality in the Coast Guard**

As revealed by the research, the disadvantages inherent to compliance inspections contradict the Coast Guard's recently established goals of continuous improvement and increased innovativeness. This leads to us the question of whether TQM provides the Coast Guard the tools necessary to establish a control mechanism that can achieve these goals.

The interviews revealed a general acceptance of TQM philosophy in the fleet. Most statements indicated support for the normative assumptions associated with self-control. Processes associated with TQM, however, were often labeled as

"hoopla." Most shipboard respondents agreed that statistics would aid them in their management functions, but many felt that the meetings and associated FADE processes were too time consuming and unnecessary. This reluctance to utilize TQM practices requires some consideration on the part of management when considering TQM implementation at sea. This aversion may only indicate a lack of training or the lack of an automated capability to gather the appropriate data.

One of the researchers, a Marine Corps Captain with over 20 years service, feels compelled to make a personal observation. After conducting so many interviews, visiting various Coast Guard commands, and observing the leadership styles of Coast Guard personnel, this "outsider" feels that TQM is more likely to succeed in the Coast Guard than in other service. The Coast Guard's unique culture (born of a public service mentality), its small size, and the inter-personal dynamics between the different ranks allows the Coast Guard to more easily assimilate the values associated with TQM. The willing belief that superiors accept the professionalism of and rely on the initiative of their subordinates indicates strong support for the normative assumptions associated with self-control.

### 3. Vision of a CSS Cutter's Integrated Control Mechanism

Theory and data have both indicated strong, positive features to external and internal control systems. Our vision of a control system aboard a CSS cutter takes notice of these strengths and incorporates them. Likewise, we attempt to mitigate the disadvantages associated with the control systems. Our description of this hybrid system leans heavily on the Coast Guard's vision of the future as described by its Logistics Master Plan.

First, organizational philosophy must be supportive of a self-control environment. The Coast Guard's Logistics Master Plan speaks to this issue.

> Our values will guide our approach to the future: **Honor:** honesty, integrity and trust are the backbone of a sustained quality organization; **People:** our people are the source of our strength. They determine our reputation and vitality. Involvement and teamwork are our core human values; **Quality:** Quality comes first. To achieve customer satisfaction, the quality of our products and services must be our highest priority. (Commandant, 1992, p. 2)

The Logistics Master Plan echoes the philosophy of a Total Quality approach to control. Since this philosophy states that management depends on and trusts its people, a self-control mechanism can be established. The importance of these "core human values" to the control system cannot be understated. It these values that will determine the interaction between individuals, sub-units and management.

The structure of our control mechanism takes shape around these basic values. The Logistics Master Plan again provides a general insight into the design of the control system.

> The future Coast Guard logistics system is envisioned to be integrated, automated, cost effective, efficient and responsive to its customers, managed by a professional, well-trained work force and inter-operable with Department of Defense (DOD) and Other Government Agency (OGA) sources of logistics support. (Commandant, 1992, p. 2)

This provides us a very broad outline for the self-control mechanism for CSS cutters.

For those areas that have a specific, legal requirement for external audits, compliance inspections will remain. In this way, management assures itself of preventing waste, fraud and abuse in those areas where the organization is legally accountable. To enhance process improvement, feedback reports will be provided to policy makers so that faulty rules may be identified and rectified as soon as possible. Inspectors will be officially charged with identifying, analyzing and reporting system innovations for possible diffusion to the fleet.

All processes not having a specific, legal requirement would be monitored and controlled at the unit level. Units would follow policy and standards outlined by the Afloat Supply Procedures Manual. Checklists, to be used for internal management, training and relief procedures, would be provided

and used by MLC CSS training and assist teams. These checklists would list broad areas that focus on value-added processes and alert the ship to procedures designed to enhance performance. By providing these types of checklists, the training and learning curve advantages associated with compliance-oriented control systems are retained.

Procedures, outlined in the ASPM, must include well-defined standards of performance. These standards would represent the operational, readiness, responsiveness and sustainability parameters within which all CSS cutters would operate. We realize that CSS cutters are dealing with significant issues left by FRAM, major weapon retrofits, CSS implementation and demanding Ready-For-Sea and operational schedules. We think that the first round of MLC CSS assist visits should be used to establish these baselines of performance. The CSS assist teams could identify the best-of-class procedures and levels of performance. These teams could also assist ships in identifying allowance shortfalls and enhancing their customer focus by providing relevant SIM data from other CSS vessels.

All control systems compare performance to desired results. Self-control demands a constant monitoring capability over the supply system's processes to minimize the

variance of actual results from acceptable standards. Automation would play a significant role in self-measurement.

> Logistics information management systems must be modernized and merged to facilitate an integrated, response-oriented Coast Guard logistics system and allow for inter-operability with DOD logistics networks. (Commandant, 1992, p. 2)

Computers would automatically collect data as items are demanded, receipted and issued aboard cutters. Computers would produce understandable management reports and graphs at a single key stroke. As interviews indicated, for statistics to be used aboard ships, collection and analysis must be relatively easy and painless in the sense that they be made "sailor-proof" and not time consuming.

Cutter personnel indicated an interest in several statistical measurements. Command staff (COs and XOs) thought measurements of readiness and sustainability would offer them greater management oversight. Statistics dealing with percentage of allowances and high usage (SIM) parts on board would give them an indication of mission readiness. In addition to these statistics, measures of responsiveness, level of commercial purchase activity vice supply system requisitions and economic reorder points would be of interest to supply department representatives.

Statistics would not be used only by the cutters. A data link between the ships, the MLCs and the Coast Guard supply support centers would increase flow of information from customers and suppliers over a range of issues (e.g., usage data, configuration reports, allowance verification, and readiness levels). This data link would be a "pull-type" versus a "push-type" system. This unilateral data collection method permits the ship to continue to perform its primary missions while allowing the MLCs and supply centers to obtain raw data necessary to meet oversight and customer/supplier responsibilities.

Raw data presents a clearer picture to the logistics chain-of-command because it precludes data contamination and manipulation. This unrefined data, when aggregated at the MLC level, would allow MLC and Area commanders to identify standards of readiness and sustainability for their subordinate units and to identify needed changes in policies. Shore support units would aggregate the data to provide increased support in parts availability and enhanced configuration management so that shipboard readiness may increase. This type of "pull" feedback enhances the customer/supplier relationship without creating additional administrative burdens for the field unit.

Self-control at the unit level requires a supporting structure up the chain-of-command to analyze statistical data and diffuse process improvements across the fleet. The Coast Guard's linking structure would provide this level of support. Shipboard Natural Working Groups would report their innovations to permanently established, Logistics Quality Management Boards at the MLCs. Former compliance teams would act as QMB analysts, reviewing data and watching individual cutter and aggregated trends. If they identified a disturbing trend on a certain cutter, the CSS training team could assist in problem identification and resolution or in process improvement. These teams could also make annual assist visits to train and identify any process improvements that had not been previously reported. This type of linking structure, as noted in earlier chapters, provides increased feedback, diffuses unit-level improvements, and increases worker participation in policy and rule formulation.

## D. CONCLUSION

The Coast Guard implemented Centralized Shipboard Supply to help resolve earlier problems of poor inventory management and other supply support issues. By instituting CSS, Headquarters changed shipboard organizations, policies and procedures. It did not, however, make a commensurate change

in the supply system's control mechanism. Compliance inspections have only recently reached the HECs, and even then, they do not evaluate CSS procedures. TQM's rise as the management tool-of-choice in the Coast Guard may offer some suggestions for an improved control system.

This thesis concerns itself with two alternative control mechanisms, compliance-oriented control and self-control. Thesis research indicates a balancing connection between control and organizational efficiency and adaptability. As organizations attempt to institutionalize one attribute, it is usually at the expense of the other.

The first alternative, compliance inspections, is an after-the-fact detection of errors. This type of oversight rests on normative values of management-employee distrust, a belief that individuals lack motivation and commitment to the organization's work. These beliefs lead to a system where management generates all policies, checks for consistency of effort and is the only element which may make changes to existing policies. While this system increases organizational efficiency through procedural uniformity, it discourages innovativeness and unit-level adaptability. This type of system also leads to wasted resources, rule following, and time-late corrections to the system.

The Quality Advantage, the Coast Guard's variant of TQM, offers an alternative of self-control to the external monitoring of compliance inspections. Self-control mechanisms are preventive in nature because they use statistical measurements to review process and product alike. Normative values of trust and individual motivation are the cornerstones of TQA. By empowering its workers to improve prccesses, a self-control organization increases innovativeness; however, it must be willing to accept some variance in performance to nurture this improvement-focused environment. The greatest challenge to shifting to this type of control system is the recalcitrant, bureaucratic structure and its reliance on a contradictory, power-maintaining philosophy.

The Coast Guard's recent commitment to continuous improvement has led it to accept a management strategy that seeks to increase innovation while maintaining its regular structure and its associated culture and philosophy. TQA requires the Coast Guard to adopt a radically different philosophy than the one that supports its current compliance inspection system. To balance these seemingly contradictory efforts, the Coast Guard has created an overlay organization. This structure parallels the regular organizational structure but encourages participative management and the flow of ideas throughout the organization. This design hopes to increase

innovation, enhance customer-supplier relationships and institutionalize successful improvements throughout the organization. The free-flow of ideas within the parallel structure is critical to its success. There is some question whether people can effectively contribute in a parallel structure and then return to the more restrictive military environment.

Our vision for integrated control onboard CSS cutters accommodates these strengths and weaknesses of both internal and external control systems. Our proffered control mechanism calls for accepting the normative assumptions associated with self-control: workers are self-motivated, hard working and truly interested in bettering the system. By providing the ability for self-measurement and continuous feedback, the Coast Guard could institutionalize the individual characteristic it has historically cultivated and on which it has depended, personal initiative. By entrusting its CSS cutters with self-control, the Coast Guard would continually improve its supply processes, increase innovation, and realize significant benefits in increased sustainability and readiness.

Before the Coast Guard can achieve these advantages, it must come to a conclusion about its management philosophy. The control systems analyzed by this thesis are based on

radically different and opposing normative assumptions. Compliance inspections advocate a "hammer and nail" philosophy. Accordingly, management uses its authority to hammer personnel into performing appropriately so that organizational goals are met. Self-control, on the other hand, rests on a philosophy of mutual trust and professional respect. In this environment, workers and management join forces to meet organizational goals. The thesis has described the merits of both systems. Any decision between internal and external control systems is tied to the dilemma posed by their opposing philosophies. Before it can make its choice, the Coast Guard must wrestle with the fundamental question: "Can people be trusted to do their jobs without management looking over their shoulders?"

## E. RECOMMENDATIONS

After careful review of literature and supporting theories, as well as conducting an interview process to understand the feelings about control systems, we have several recommendations to make.

- Given the relative strengths and weaknesses of external and internal control systems and its recent goal of Quality management and continuous improvement, the Coast Guard should reconsider its use of compliance-oriented control mechanisms.

- The Coast Guard should consider the value added by its control mechanism to the operational readiness and sustainability of its fleet.

- The Coast Guard should consider establishing a control mechanism that integrates the positive features of compliance mechanisms (e.g., training and checklists) and self-control (e.g., innovation, self-measurement, and continuous improvement).

- The Coast Guard should investigate means to mitigate lingering skepticism about TQM as detected during the interview of shipboard personnel.

The following recommendations list specific implementation proposals that would enhance feedback mechanisms and establish self-measurement, thereby increasing innovativeness and promoting continuous improvement of supply processes.

- Headquarters should establish baseline measurements of effectiveness (MOEs) for cutter supply operations.

- Measurements should minimally include requisition responsiveness, inventory location verification, fill rate (both SIM and mandatory allowance items), and number of off-line parts requisitions.

- Headquarters should identify/develop automated capabilities that gives one-touch management reports and graphs to improve shipboard management system

- Headquarters should investigate the applicability of DOD automated supply support programs (i.e., USMC SASSY system and USN Snap-II system) to increase connectivity between cutters and supply support commands.

- Headquarters should institute a "pull-system" of electronic data transfer so that MLC analysis teams can identify and assist ships that experience a drop in their measures of effectiveness.

- An automated system interface between ships and inventory control points and Headquarter policy makers should be created to increase flow of communications and to broaden availability of raw usage data and MOE reports.

- The Maintenance Logistics Commands should establish permanent QMBs to analyze logistics problems. These QMBs should include cutter representation.

- MLCs should become clearing houses for very informal "lessons learned" inputs. An electronic bulletin board, telephone calls, and penned letters would increase information flow and diffuse shipboard innovations throughout the fleet.

## F. FUTURE AREAS FOR ADDITIONAL STUDY

This research poses interesting areas for future study. While the areas of possible research are broad, our list remains focused on the Coast Guard and its centralized supply system.

- Define measures of effectiveness for CSS cutters

- Define a self-measurement program for CSS cutters, including automated and manual procedures (e.g., checklist items)

- Evaluate CSS' effectiveness in improving logistics support in terms of greater supportability and improved readiness

- Evaluate the Coast Guard's overlay structure's ability to increase innovativeness by generating a more open, communicative environment

- Determine the transformational impact of the Coast Guard's overlay structure on the formal organization's culture

## APPENDIX A - LIST OF ABBREVIATIONS

ASPM - Afloat Supply Procedures Manual

CGQC - Coast Guard Quality Council

CO - Commanding Officer

CSS - Centralized Supply System

ELM - Coast Guard Headquarters, Engineering Logistics Management Division, Office of Engineering

ESC - Executive Steering Committee

FADE - Focus, Analyze, Develop, Execute; a TQA process

FRAM - Fleet Rehabilitation and Modernization

HEC - High Endurance Cutter, also known as a 378

LMI - Logistics Management Institute

MLC - Maintenance Logistics Command

MOE - Measures of Effectiveness

NWG - Natural Working Group

ODI - Organizational Dynamics, Inc.

OER - Officer Evaluation Report

PLS - Parallel Learning Structure

QAT - Quality Action Team

QMB - Quality Management Board

SIM - Special Item Management

TQA - The Quality Advantage

TQM - Total Quality Management

XO - Executive Officer

## APPENDIX B - INTERVIEW QUESTIONS

I. What are the merits of TQM and compliance inspections as a means of controlling CSS processes?

**A. What is the status of compliance inspections aboard CSS cutters?**

PRIMARY QUESTIONS:

1- Can you describe your last unit inspection?

2- Do you find inspection standards lower, higher or reflective of your daily routines?

3- Do inspections look at those things you actually do to accomplish the mission?

4- Overall, do you think inspections help you or hurt you? Why?

5- Do inspections improve your shipboard processes? In the short term? In the long term?

**B. What current self-control methods would be enhanced by TQM?**

PRIMARY QUESTIONS:

6- How do you know you are doing a good job?

7- Have you found ways to make the supply system better?

8- Have you passed on your improvements to other ships?

9- What supply systems help you to perform your mission?

10- Are there procedures on your ship that lend themselves to measuring your logistic goals?

11- What measures of system performance would you like at your disposal to ease your management function?

INSPECTION'S SECONDARY QUESTIONS:

1- What are the positive aspects of inspections?

2- What are the negative aspects of inspections?

3- How do you evaluate supply system efficiency?

4- How do you evaluate supply system responsiveness?

5- How do you evaluate system economy?

6- When was your last inspection?

7- Who currently benefits from inspections?

8- Philosophically, who should benefit from inspections?

9- After the inspection, did you remain at the inspection standard, exceed the standard, or fall back to your pre-inspection routine?

10- Do inspections require any additional work to prepare for them? If so, how much? (time frame?)

11- Do major inspection deficiencies need to be reported outside the unit to ensure they are corrected? Why?

12- Who should receive inspection reports? (Supply Officers? COs? MLC? HQ? Other Ships?) Why?

13- Do you consider supply standards to be minimum or maximum performance standards?

14- Should every ship be performing its supply procedures exactly the same?

15- What areas generally require additional work before an inspection team shows up?

16- Do you consider these areas important to your basic mission?

17- Do you consider inspection reports to have a positive or negative impact on the unit?

SELF-CONTROL'S SECONDARY QUESTIONS:

1- What logistics issues determine a unit's success?

2- How do you contribute to meeting this goal?

3- Does the ASPM provide sufficient guidance?

4- Are there ASPM requirements that you concentrate more on? Are there ASPM requirements you know you are not meeting? If so, what are they?

5- Who do you consider your customers?

6- Can you prioritize your customers?

7- (If yes) What basis allows you to prioritize your customers?

8- Has the available automation package made your job easier?

9- Do you use any statistics? If so, what are they?

10- If you could have any three wishes to improve the supply system, what would they be? (Prioritize)

11- Do you use the available automated systems?

SCAMP: Have/not have use/don't use if don't use, Why?

ARMS: Have/not have use/don't use if don't use, Why?

LUFS: Have/not have use/don't use if don't use, Why?

Certified/Not Certified

Bar coding:Have/not have use/don't use if don't use, Why?

OTHER SYSTEMS: ????

12- How often do you conduct spotcheck inventories?

13- How often do you conduct bulkhead-to-bulkhead inventories?

14- Do you maintain a Special Item Management (SIM) deck?

15- How often do you update SIM? How do you update it?

16- Are your property records up-to-date?

17- Do you have excess Depot Level Repairable parts in your storeroom? Dollar value?

18- Has your ship undergone any shipalts, ordalts that would have affected your inventory? If so, have you purged and added the different parts associated with the shipalt?

19- What changes would you suggest to improve automation?

20- What are your perceptions of TQM?

21- What messages are your superiors sending to you about TQM in the Coast Guard?

22- How do you find out about improvements to the supply system?

23- (For MLC, Area, HQ) How do you determine when a policy change is required?

24- Is there a "lessons learned" communications system that enables you to improve your supply system?

25- Should there be a "lessons learned" system? Either formal or informal?

## APPENDIX C - SUMMARY OF CONFERENCE POINT PAPERS

The following bullets summarize the cutter point papers submitted for the 1992 Afloat Logistics Workshop. The ships were asked to identify weak areas in current logistic programs. This summary is taken from Section V of the Workshop's Conference Notes. Cutters' concerns include:

- undertrained supply personnel; no coordinated training strategy (initial and replenishment)
- poorly defined roles of MLCs, field organizations, Districts in logistics chain
- unclear afloat logistic support policies
- management functions should be separated from maintenance engineering
- ships need on-going shore support; varies with port and personalities. Need for standard support policy for all afloat assets at all ports
- ships use too much time and manpower to fend for themselves - competes with operational requirements
- hazardous materials and environmental programs either not standard or not available at all ports
- need for coast-wide standard contracts for handling and disposing of hazardous material/waste. Possible use of existing Navy/DOD programs
- too much time and effort wasted in band-aid fixes for recurring problems
- use of permanent senior enlisted "Logistic Assist Teams" (LATs) to routinely visit and help with supply "nuts and bolts," training, augment undermanned supply organizations

- need executive level training for non-supply personnel in plain English
- allowance programs such as CALMS, ERPAL not in sync. Look for one standard afloat system
- afloat systems must be compatible with shore systems
- programs should be piloted before installing afloat.
- provide logistic management support closer to afloat units.
- empower MLCs to provide more care and feeding of supply products (CALMS, etc.)
- strategically locate storage facilities
- need review of afloat billet structure/organizations (rate and ratings)
- need to replace "stove-pipe" computer systems. In example: LUFS, SCAMP, ARMS, etc., with a more integrated procurement, management, inventory control, and budget management system.
- need top-down/cross functional review for identifying logistic requirements afloat.
- its time to use current technologies: Bar coding, CD ROM. Costs too much not to.
- materials that are no longer needed aboard are starting to grow again.
- dockside support functions need to be identified, resources allocated and clean lines of authority and responsibilities outlined. Heavy emphasis on follow-up actions, supply policy and procedural issues, monitoring of usage data, etc.
- align ELM functions with a focused logistics organization at MLCs (similar to ENE and MLC(v))
- move non-critical material ashore. Free up space for critical items afloat. Storage ashore managed by MLCs.

- need more formalized support by dedicated shore logistics organization. Too many informal arrangements made by ships.
- define functions needed for an ashore logistics organization
- improve/clarify supply officer career path in logistics
- need more continuous, in-depth training for supply officers
- percentage of time that supply officers work on supply matters varies from ship to ship. Need for policy clarification
- need for a standard set of supply manuals to be carried on board.
- need centralized contracts and management: life raft inspections, hazardous waste removal, waste oil removal, rigid hull inflatable boats
- standardization of allowance parts lists and allowance equipage lists
- design allowance and configuration change programs through E-mail
- maximize use of afloat supply personnel on QATs or other development teams. Use of fleet input currently minimal
- increase use of automated supply systems currently used by USN. Same functional needs as Coast Guard; may be cheaper and more accessible.
- review the policy of sending complex software directly to the units for their own installation. Too many computer-inexperienced people on board. Use proposed Logistics Assist Team to install and train for new systems. Also need a Information Status Accounting System to monitor, control and manage hardware and software, changes, etc.
- ASPM in need of improvement. Too costly not to implement improvements
- improve credibility and trust in allowance change process

## EPILOGUE

Even though the Coast Guard has recognized a need to gain continuous improvement and increase its organizational innovativeness, the current control system still requires uniformity in CSS activities. This prologue addresses this need for standardization but cautions the reader about the limitations associated with compliance-oriented control mechanisms. Research indicates that external, compliance control leads to rule-following, decreased innovativeness and a short-term focus on identifying product defects.

Given that caveat, there are certain steps that should be taken to enhance the current compliance control system. We believe that a coordinated effort between the compliance teams and the new CSS teams can increase standardization, identify innovations and correct problems in policy and procedure.

We believe that the MLC and CSS teams should coordinate their ship visits to increase training and feedback. Six months prior to an inspection visit, the CSS team can conduct a training/assist visit using the same checklist that the inspection team uses. The CSS team would increase awareness of ASPM requirements, assist the ship where needed and identify those procedures that ships have improved. These

improvements could be analyzed and recommended for fleet-wide publication by Headquarter policy makers if acceptable. The follow-on visit by the inspection team would reinforce established procedures and make the inspection team the "bad guys" if enforcement were necessary.

Current compliance checklists should be updated to include CSS procedures. Our analysis of the ASPM requirements, presented in checklist format, follows. Our checklist does not imply an endorsement of the ASPM processes but represents what the directive currently requires of CSS cutters. This checklist only covers CSS-specific topics. Other supply issues, like commercial procurement, property control and imprest fund management, while addressed by the ASPM, are already adequately covered by current inspection programs. As the checklist is used, inspection teams will identify those procedures that have been changed or ignored by the fleet. With this in mind, our proposed checklist becomes a good "straw man" that can be used to improve CSS procedures.

## Publications

1. Have procedures been established for review and validation of publication requirements. (COMDTINST M4400.17, Chapter 3, Section A-2-b and Section E-19-c)

2. Has the Allowance List for Directives, Publications and Reports Index (COMDTNOTE 5600) been reviewed and changes submitted? (COMDTINST M4400.17, Chapter 3, Section E-19-c)

3. Suggested listing of publications which should be on automatic distribution for supply:

| Publication | Subject |
|---|---|
| COMDTINST M4200.19 | Coast Guard Acquisition Procedures |
| COMDTINST M4200.13 | Small Purchase Handbook |
| COMDTINST M4400.13 | Supply and Property Manual |
| COMDTINST M4400.15 | Automated Requisition Management System (ARMS) User's Manual |
| COMDTINST M4400.17 | Afloat Supply Manual |
| COMDTINST M4400.19 | Fed. Supply Classifications,Part III |
| COMDTINST M4500.5 | Property Management Manual |

| | |
|---|---|
| COMDTINST M4600.11 | Transportation Manual |
| COMDTINST 5213.6 | Catalog of Forms |
| COMDTINST M5440.2 | Operating Facilities of USCG DODAAD |
| COMDTINST M16478.2 | Procurement, Handling and Disposal of Polychlorinated Biphenyls Manual |
| DOD 4140.25-M | Fuel and Petroleum |
| DOD 4000.62-6-M | (Microfiche) DOD Activity Address Directory |
| DOT 2770.7A | Imprest Fund Manual |
| MRIL 4107 | NAVSUP Mandatory Turn-in Repairables |
| SICPINST M4441 | CALMS Series |

## Managing Allowances

1. Are allowance change request properly utilized and submitted as they occur to update Combined Allowance for Logistics Maintenance and Support (CALMS)? (COMDTINST M4400.17, Chapter 2, Section D-8-a)

2. Are allowance change requests responded to on an interim basis by the appropriate supply center within 45 Days? (COMDT MSG 231445Z Oct 90)

3. Are allowance change requests properly validated and submitted by supply personnel? (COMDTINST M4400.17, Chapter 2, Sections D-8-g-4 and D-8-h,i,j)

4. Are ERPAL allowance lists and package supply aids complete when provided to the ship? (COMDTINST M4400.17, Chapter 2, Section D-10-d/e)

5. Is the MLC/District commander advised of any additional funds required to procure deficiencies generated as a result of the receipt of a ERPAL? (COMDTINST M4400.17, Chapter 2, Section D-10-F-5)

6. Are the CALMS/ERPAL programs properly administered by the supply officer? (COMDTINST M4400.17, Chap 2,Section F-2-e-5-a)

## Requisitioning

1. When demands are submitted, are dollar criteria exceptions reviewed and justifications made? (COMDTINST M4400.17, Chapter 3, Section A-1-b)

2. Are supply personnel submitting requisitions to the sources of supply via the Automated Requisition Management System (ARMS) or via the MLC ? (COMDTINST M4400.17, Chapter 3, Section A-2-a)

3. Does the requisitioning clerks have the required publications to purchase supplies and or services? (COMDTINST M4400.17, Chapter 3, Section A-2-b)

4. Has the cutter set-up requisitioning objectives to minimize cost? (COMDTINST M4400.17, Chapter 3, Section B-1-b)

5. Are quarterly requisitioning cycles being used to synchronize the ordering of material along with the allocation of funding? (COMDTINST M4400.17, Chapter 3, Section B-2-b)

6. How does the ship determine its requirements for stockage. Is the 90 day supply of materials and seasonal fluctuations considered? (COMDTINST M4400.17, Chapter 3, Section B-2-c)

7. Does the ship use priority source selection when requisitioning supplies and services? (e.g. Federal Prison Industries, Federal Supply Schedules) (COMDTINST M4400.17, Chapter 3, Section A-1-b)

8. Are "substitute items" or "one way interchangeables" used properly? (COMDTINST M4400.17, Chapter 3, Section B-2-e)

9. Does the ship ensure document material numbers are not duplicated? (COMDTINST M4400.17, Chapter 3, Section B-3-m-5-a and Chapter 5 Section A-2-b)

10. Are priority designators consistent with the actual urgency of need and the ship's assigned FAD? (COMDTINST M4400.17, Chapter 3, Section B-3-t)

11. Does the ship submit Non-NSN and Part Numbered CASREP requisitions directly to source of supply for processing? (COMDTINST M4400.17, Chapter 3, Section B-5-h/i)

12. Are NMCS/PMCS requisitions submitted by message unless transmittal by other means are considered more expeditious by the requesting unit? (COMDTINST M4400.17, Chapter 3, Section B-5)

13. Is the source of supply providing status to the requisitioners within the UMMIPS timeframes? (COMDTINST M4400.17, Chapter 3, Section C-1-a)

14. Does the supply department monitor incoming status? (COMDTINST M4400.17, Chapter 3, Section C-2-g)

15. Are status cards attached to the material outstanding file copy of the related requisition? (COMDTINST M4400.17, Chapter 3, Section C-2-g)

16. Has the cutter taken appropriate action on follow-ups for outstanding requisitions? (COMDTINST M4400.17, Chapter 3, Section C-3)

17. Is a review of requisitions in the material outstanding file done by priority? (COMDTINST M4400.17, Chapter 3, Section A-2-b) COMDTINST M4400.17, Chapter 3, Section C-3-c)

18. What actions are taken to address material shipped by the supplier but never received by the unit? (COMDTINST M4400.17, Chapter 3, Section C-3-c)

19. Are modifications of outstanding requisitions previously submitted conducted properly and in a timely manner? (COMDTINST M4400.17, Chapter 3, Section C-4)

20. Does the ship request cancellation correctly for those outstanding requisitions for supplies and services no longer required? (COMDTINST M4400.17, Chapter 3, Section C-5)

21. What timeframes are established by the ship concerning Material Obligation Validation (MOV) for unfilled quantities on requisitions? (COMDTINST M4400.17, Chapter 3, Section C-6-e/f)

22. Have purchases been made using sources other than those listed citing public exigency as a basis for such purchases and if so, was the purchase made within the bounds of the supply officer's purchase authority? (COMDTINST M4400.17, Chapter 3, Section A-1-b-3)

**Procurement from SERVMART**

23. Are SERVMART Shopping List (SSL) properly reviewed and filed by the supply department? (COMDTINST M4400.17, Chapter 3, Section D-1-e)

24. Are inspections and reconciliations conducted to assure proper handling of materials received from SERVMART? (COMDTINST M4400.17, Chapter 3, Section D-2-d)

25. Are those items considered "controlled property" purchased at SERVMART properly managed and accounted for? (COMDTINST M4400.17, Chapter 3, Section D-2-e)

**Acquisition of Special Items, Equipment, Supplies and/or Special Services**

26. Are mandatory contracts used by the cutters for fuel, lubricants and solvents? (COMDTINST M4400.17, Chapter 3, Section E-2)

27. Is the supply officer responsible for obtaining fuel and making all necessary arrangements with supply activities or contractors? (COMDTINST M4400.17, Chapter 3,Section E-2-c-3-b)

28. Are all requirements being met concerning special circumstances in preparation of contracts for bulk petroleum products? (COMDTINST M4400.17, Chapter 3, Section E-2-e-2)

29. Does the ship properly procure paint materials and are they properly stored? (COMDTINST M4400.17, Chapter 3, Section E-5)

30. Is required safety equipment acquired and properly accounted for? (COMDTINST M4400.17, Chapter 3, Section E-8)

31. Does the ship properly process requisitions for compressed gas and compressed gas cylinders? (COMDTINST M4400.17, Chapter 3, Section E-11)

32. Has the ship ordered lumber, millwork, plywood or veneer in excess quantities through direct local commercial sources? (COMDTINST M4400.17, Chapter 3, Section E-13)

33. Prior to procurement of automated data processing (ADP) equipment is prior authorization obtained from MLC? (COMDTINST M4400.17, Chapter 3, Section E-15)

34. Have action agencies responded to an original ROD submission within 45 days and was the submitter notified when the ROD was passed to another activity? (COMDTINST M4400.17, Chapter 4, Section C-8-e)

35. Is the first follow-up submitted to the action agency 60 days after the original ROD submission and at subsequent 30 day intervals? (COMDTINST M4400.17, Chapter 4, Section C-8-e)

36. If a reply is not received within six months from the submission of the ROD has the unit closed the ROD record and requested assistance from the MLC/DC to adjust financial records and obtain credit? (COMDTINST M4400.17, Chapter 4, Section C-8-e)

## Mandatory Turn-In Repairables

1. Has the ship established an exchange program for repairable items? (COMDTINST M4400.17, Chapter 3, Section G-1-c and Chapter 5, Section B-5)

2. Does tne ship have on file repair prices established by SICP to compare charges? (COMDTINST M4400.17, Chapter 3, Section G-1-e)

3. Does the ship use the correct advice code when repairables are turned in? (COMDTINST M4400.17, Chapter 3, Section G-1-e-2)

4. What is in place for using Navy Repairables? (COMDTINST M4400.17, Chapter 3, Section G-2-a)

5. Does the supply officer have on board a listing of ways to identify those DLR's supported by the Navy owned equipment for funding requirements? (COMDTINST M4400.17, Chapter 3, Section G-2-c)

6. Does the ship have the Navy's Master Repairables Item List (MRIL) (NAVSUP Publication 4107) on board as a ready reference to ensure DLR's are properly identified and transferred to Navy Maintenance Facilities? (COMDTINST M4400.17, Chapter 3, Section G-2-c-2)

7. Are fund codes used properly for requisitioning DLR? (COMDTINST M4400.17, Chapter 3, Section G-2-c-4)

8. For Mandatory Turn-In/Depot Level Repairables which were requisitioned citing priority designators 06 or higher, was this properly authorized? (COMDTINST M4400.17, Chapter 3, Section G-2-d)

9. Are supply personnel checking the MRIL repair maintenance code to determine if a DLR should be sent to a repair or a test facility? (COMDTINST M4400.17, Chapter 3, Section G-2-f)

10. Are supply personnel trained to properly identify Field Level Repairable items using the ML-C and Material Control Code (MCC)? (COMDTINST M4400.17, Chapter 3, Section G-2-f-3)

11. For Mandatory Turn-In Repairables (MTR) does the suspense file have a skeletonized DD-1348-1 filed by work Center Code? (COMDTINST M4400.17, Chapter 6, Section E-2-g)

## Inventory Control Procedures

1. Are NAVSUP 1250-1's used as an internal control document for requesting repair parts, general purpose property and consumables? (COMDTINST M4400.17, Chapter 6, Section F-2-a)

2. Has an approval signature from the department head requesting the material been placed on the NAVSUP 1250-1 for controlled items, services and urgency of need indicator "A" items? (COMDTINST M4400.17, Chapter 6, Section F-2-c)

3. Are authorized personnel the only ones drawing material from stock? (COMDTINST M4400.17, Chapter 6, Section F-2-c)

4. Are issue transactions posted in ink to stock records daily? Are issues which are SIM items posted first? Are issues being pre-posted? (i.e., posted prior to issue of material) (COMDTINST M4400.17, Chapter 6, Section F-5-a)

5. For inventory loss are NAVSUP 1250-1's properly annotated and signed by the Supply Officer in Block 30? (COMDTINST M4400.17, Chapter 6, Section F-5-c-3)

6. If material is used for a maintenance action and was obtained from other than normal supply sources (e.g. salvage, cannibalize, local manufacture) was a NAVSUP 1250-1 prepared by the responsible work center to document and report usage? (COMDTINST M4400.17, Chapter 6, Section F-8-a)

## Management of Repair Parts and Consumables

1. Is a quarterly review accomplished for SIM items designated as repair parts/consumables? (COMDTINST M4400.17, Chapter 6, Section D-2-a-1-b)

2. Has the supply department conducted a verification or updated manual stock records when a new ML-C arrives? (COMDTINST M4400.17, Chapter 6. Section D-2-a-1-d)

3. Is stock replenishment for SIM repair parts and consumables based on demands using high and low limits? (COMDTINST M4400.17, Chapter 6, Section D-2-a-1-e)

4. Are two separate files kept for SIM and Non-SIM items? (COMDTINST M4400.17, Chapter 6, Section D-2-a-1-f)

5. Are items identified as SIM items meeting the two hits in six months demand usage? (COMDTINST M4400.17, Chapter 6, Section D-2-e)

6. Are Mandatory Turn-In Repairables (MTR) items being stocked as SIM material?(COMDTINST M4400.17, Chapter 6, Section D-2-f)

7. At the quarterly review are SIM items redesignated as Non-SIM items and are all entries properly posted to the stock records? (COMDTINST M4400.17, Chapter 3, Section D-2-h)

**Stocking Policies**

* Repair Parts

8. Does each item stocked on board the vessel have a Stock Record? (COMDTINST M4400.17, Chapter 6, Section D-3-a-1)

9. Does the cutter have and use an automated inventory management system? (COMDTINST M4400.17, Chapter 6, Section D-3-a-1)

10. Have custodians been appointed for repair parts stocked in areas other than the supply department? (COMDTINST M4400.17, Chapter 6, Section D-3-a-1)

11. Are SIM items stocked to achieve an average endurance level of 90 days? (COMDTINST M4400.17, Chapter 6, Section D-3-a-2)

12. Are Not Carried (NC) items properly verified to ensure that the item is identified properly and the parent equipment is supported in CALMS or ERPAL? (COMDTINST M4400.17, Chapter 3, Section D-3-a-4)

*Consumables

13. Are consumables procured to maintain an average endurance levels of 90 days for equipment related and 60 days for nonequipment (general use) consumables? (COMDTINST M4400.17, Chapter 6, Section D-3-b)

14. Does the supply department maintain records of historical demand to meet consumable requirements? (COMDTINST M4400.17, Chapter 6, Section D-3-b)

*Pre-Expended BIN (PEB) Material

15. Has the supply officer and department heads developed a listing of those items needed as Pre-Expended BIN material. (COMDTINST M4400.17, Chapter 6, Section D-3-c)

16. Are Non-SIM and Non-Maintenance related SIM items being stocked as PEB? (This is not allowed) (COMDTINST M4400.17, Chapter 6, Section D-3-c-1)

17. For those items stocked as PEB does demand frequency show usage of five or more per month cutter-wide or two or more per month from the same department or work center? (COMDTINST M4400.17, Chapter 6, Section D-3-c-2)

18. Does the quantity on hand show only one month stockage of supplies? (COMDTINST M4400.17, Chapter 6, Section D-3-c-3)

19. If the unit price is over $50 for a PEB item has the Commanding Officer authorized the stockage of these item in writing? (COMDTINST M4400.17, Chapter 6, Section D-3-c-4)

20. Are items with assigned storage codes indicating a requirement for specialized storage (e.g., hazardous/flammable items) store as PEB's? (COMDTINST M4400.17, Chapter 6, Section D-3-c-8)

21. Are PEB items with pilferage code I, Y and Z retained in a security cage? (COMDTINST M4400.17, Chapter 6, Section D-3-c)

22. Is the range and depth of onboard stock reviewed and is it meeting the limits established in order for the cutter to meet its assigned mission? (COMDTINST M4400.17, Chapter 6, Section A-2-b)

23. Are items being stocked based on allowance lists and on a demand basis? (COMDTINST M4400.17, Chapter 6, Section A-2-e-1)

24. Are items stored in other departments inventoried quarterly? (COMDTINST M4400.17, Chapter 6, Section B-1-c-5-f)

25. Has the ship used the prescribed methods for conducting inventories? (COMDTINST M4400.17, Chapter 6, Section B-1-g-3)

**Maintenance Assistance Modules (MAM)**

26. Has the supply officer maintained a stock record for each MAM authorized onboard? (COMDTINST M4400.17, Chapter 6, Section D-3-d)

27. Are MAM being inventoried semiannually? (COMDTINST M4400.17, Chapter 6, Section D-3-d)

**Excess Stock**

28. Has the ship taken every effort to identify and purge excess repair parts? (COMDTINST M4400.17, Chapter 6, Section D-3-e)

## Inventory Management Records and Files

1. Do stock records, other than SIM-DTO, show storage locations and current on hand balances? (COMDTINST M4400.17, Chapter 6, Section E-1-a-1)

2. Do manual stock records contain the minimum data elements? (COMDTINST M4400.17, Chapter 6, Section E-1-a-2)

Yes___ No___ Cognizant ICP/Source of Supply

Yes___ No___ NSN or ACN

Yes___ No___ Nomenclature and Descriptive Data

Yes___ No___ Part Number

Yes___ No___ Unit of Issue

Yes___ No___ Condition Code

Yes___ No___ Storage Location

Yes___ No___ Substitute Item

Yes___ No___ Quantity On Hand

Yes___ No___ Quantity Due Out

Yes___ No___ Quantity Due In

Yes___ No___ Reorder Point/Stockage Objective

Yes___ No___ Allowance Quantity

Yes___ No___ Unit Price

Yes___ No___ Hazardous Condition Code (if applicable)

Yes___ No___ Shelf-Life Code (if applicable)

3. When like items are kept on hand are separate stock records maintained for different condition codes? (COMDTINST M4400.17, Chapter 6, Section E-1-a-2 note)

4. If the ship is using a data base program are weekly backup copies available for review? (COMDTINST M4400.17, Chapter 6, Section E-1-a-5)

5. Are high priority requisitions sequenced and separated from routine requisitions? (COMDTINST M4400.17, Chapter 6, Section E-2-a-1)

6. Is the procurement tickler file properly maintained and file copies kept? (COMDTINST M4400.17, Chapter 6, Section E-2-c-1)

7. Is the Historical Demand File properly maintained and sequenced? (COMDTINST M4400.17, Chapter 6, Section E-2-d)

## Material Receipts

1. Has appropriate annotations been made on all receipt documents? (COMDTINST M4400.17, Chapter 4, Section C-1)

   a. Date the document upon receipt? Yes___ No___

   b. Circle the quantity accepted? Yes___ No___

   c. Sign the document to indicate receipt? Yes___ No___

2. Are material inspection and receiving reports (DD-250) for delivery of materials procured under government contract properly filed and annotated? (COMDTINST M4400.17, Chapter 4, Section C-2)

3. Are the appropriate blocks on the 1348's and 1348-1's correctly filed out when material is received from the source of supply and filed properly? (COMDTINST M4400.17, Chapter 4, Section C-2-c and d)

4. Are the appropriate blocks on the DD-1149 form completed properly and filed correctly for future reference. (COMDTINST M4400.17, Chapter 4, Section C-2-e)

5. Are dummy receipt documents used when material is received without a receipt document? (COMDTINST M4400.17, Chapter 4, Section C-2-h)

6. Are up-to-date receipt files complete and on hand for review? (COMDTINST M4400.17, Chapter 4, Section C-3-a)

7. Does the Material Outstanding file contain a copy of <u>all</u> procurement documents for material or services not yet received? (COMDTINST M4400.17, Chapter 4, Section C-3-b)

8. Does the material completed file contain a copy of all procurement documents which have been removed from the material outstanding file upon receipt or cancellation of material or services, plus a copy of the applicable receipt document? (COMDTINST M4400.17, Chapter 4, Section C-3-c)

9. Does the cutter have a miscellaneous file for material received but not ordered by the cutter showing receipt date and signed by the responsible material custodian? (COMDTINST M4400.17, Chapter 4, Section C-3-e)

10. Are all packages from commercial sources opened, inspected and counted by technically qualified individuals and receipt documents properly annotated? (COMDTINST M4400.17, Chapter 4, Section C-5-b)

11. During the receipt process is it easy to identify who should receive the material? (COMDTINST M4400.17, Chapter 4, Section C-6-a)

12. Are receipt documents signed in ink and legible? (COMDTINST M4400.17, Chapter 4, Section C-6-a)

13. When material is received does the 1348-1 block 10 reflect the location of where the storekeeper stored the item? (COMDTINST M4400.17, Chapter 4, Section C-6-b)

14. When material is received for Direct Turnover (DTO) is the receiving signature and date obtained on the receipt document? (COMDTINST M4400.17, Chapter 4, Section C-6-c)

15. Are priority items separated by the receiving storekeeper to avoid delays in getting the material to the end-user? (COMDTINST M4400.17, Chapter 4, Section C-6-c)

16. Does the ship process Report of Discrepancies (ROD) Standard Form 364 correctly and on time? (COMDTINST M4400.17, Chapter 4, Section C-8)

17. As items are received which were ordered (DTO) because of (NIS) status are they posted to the stock records where-by usage can be compiled for NIS items? (COMDTINST M4400.17, Chapter 4, Section C-10-c)

18. Does controlled material once received get entered on the general property records with assigned serial numbers? (COMDTINST M4400.17, Chapter 4, Section C-10-c-1)

19. As excess material is received by the supply department from other departments, does the supply section also receive either a NAVSUP Form 1250-1 (for serviceable assets) or DD Form 1577-1 (for unserviceable assets) to properly receipt for the property? (COMDTINST M4400.17, Chapter 4, Section C-10-e)

20. Does the ship submit a proper invoice to the paying office within five working days after certification and acceptance of goods/services? (COMDTINST M4400.17, Chapter 4, Section D-1-a)

21. Are appropriate property records for radioactive items established and available for inspection by the United States Nuclear Regulatory Commission (USNRC) or other cognizant authorities? (COMDTINST M4400.17, Chapter 4, Section G-2-h)

22. Are safeguards in place to insure that USNRC material is only transferred to agencies/persons holding a USNRC license or a foreign nation only when directed by proper authority? (COMDTINST M4400.17, Chapter 4, Section G-2-h)

## Temporary Storage Ashore and Storage Onboard Cutters

1. Does the cutter temporarily store shipboard material ashore for a period in excess of six months without prior approval from MLC? (COMDTINST M4400.17, Chapter 4, Section E-1)

2. Has the cutter placed into temp storage any consumable material, repair parts, tools or other items required to support a cutter's general purpose property? (COMDTINST M4400.17, Chapter 4, Section E-1-a)

3. If items are placed in temp storage are they properly documented, identified and boxed? (COMDTINST M4400.17, Chapter 4, Section E-1-b/c)

4. Are issues points and storage areas maintained in an organized manner? (COMDTINST M4400.17, Chapter 4, Section E-4 and G-2)

5. Is the property stored in a ready-for-issue condition? (COMDTINST M4400.17, Chapter 4, Section E-4-b)

6. Is a stock locator file properly maintained for items temporarily stored? (COMDTINST M4400.17,Chapter 4, Section E-4)

7. Are new locations promptly and accurately recorded in related stock records? (COMDTINST M4400.17, Chapter 4, Section E-4-e)

8. Does the ship properly store compressed gas cylinders? (COMDTINST M4400.17, Chapter 4, Section F-2-d)

9. Has the ship established a shelf life program to properly identify shelf life stock for effective control and maximum utilization? (COMDTINST M4400.17, Chapter 4, Section F-3-k and Chapter 6, Section B-1-c-5-e)

10. Are shelf life items managed to ensure first in first out (FIFO) storage is accomplished? (COMDTINST M4400.17, Chapter 4, Section F-3-k)

11. Is personal gear stored in the supply departments storerooms without approval from the Commanding Officer? (COMDTINST M4400.17, Chapter 4, Section G-1-e)

## Material Turn-ins "DRMO" Procedures

1. When turn-ins are made are DD Forms 1348-1's used? (COMDTINST M4400.17, Chapter 5, Section B-8-a-1)

2. Does the ship use the disposal authority codes to help expedite turn-ins to DRMO? (COMDTINST M4400.17, Chapter 5, Section B-8-a-2)

3. In the completed document file are copies of the DD Form 1348-1s available for review to account for property no longer on hand? (COMDTINST M4400.17, Chapter 5, Section B-8-b-1)

4. Does DRMO provide the cutter with an acknowledge receipt within the 10 day timeframe? (COMDTINST M4400.17, Chapter 5, Section B-8-b-2-b)

## Interservice Support Agreements

1. Are interservice support agreements used to the maximum extent possible or with economics can be effected without jeopardizing readiness? (COMDTINST M4400.17, Chapter 1, Section A-3-c)

2. Are interservice support agreements reviewed? (COMDTINST M4400.17, Chapter 1, Section A-3-c)

3. List interservice support agreements in effect:

| ORGANIZATION | LOCATION | SERVICES PROVIDED |
|---|---|---|
| | | |
| | | |
| | | |

## LIST OF REFERENCES


Aldag, R. J., and Stearns, T. M., Management, South-Western Publishing Company, 1991, p. 573.

Bushe, G. R., and Shani, A. B., Parallel Learning Structures: Increasing Innovation in Bureaucracies, Addison-Wesley Publishing Company, 1991.

Commandant, U.S. Coast Guard (G-ELM), UNCLAS Letter: Serial 4400 to Commanding Officer, USCGC HAMILTON (WHEC 715), Subj: Minutes of CSS Conference 28 February - 2 March 1990, 29 March 1990.

Commandant, U.S. Coast Guard (G-CCS), Preparation Material for TQM Facilitators, 1991.

Commandant, U.S. Coast Guard, UNCLAS Instruction: Serial 5224.7, Subj: Coast Guard Total Quality Management, Generic Organization, 1991.

Commandant, U.S. Coast Guard, Logistics Master Plan, 1992.

Commander, Maintenance Logistics Command, Pacific, U.S. Coast Guard, Afloat Logistics Conference Notes, March 1992.

Euske, K. J., Management Control: Planning, Control, Measurement and Evaluation, Addison-Wesley Publishing Company, 1984.

Gitlow, H. S., and Hertz, P. T., "Product Defects and Productivity." An Introduction to Quality Management: Selected Readings. Edith Goldberg, et al., eds., Navy Personnel Research and Development Center, 1987.

Gortner, H. R., Mahler, J., and Nicholson, J. B., Organization Theory: A Public Perspective. Wadsworth, Inc., 1989.

"Is the Old Way Still the Best?" Bulletin, The United States Coast Guard Magazine. March 1991.

Juran, J. M., Juran on Leadership for Quality. The Free Press, 1989.

Kime, William. "Personal Letter to Coast Guard Flag Officers," Bulletin, The United States Coast Guard Magazine, November 1990, p. 22.

Logistics Management Institute, Improving Shipboard Supply Management by Slyman, G. L., Colaianni, A. J., and Sakowski, M. J., Logistics Management Institute, 1987.

Logistics Management Institute, Focusing Planning for Supply Management: Objectives, Policies, and Review, by Slyman, G. L., Colaianni, A. J., and Sakowski, M. J., Logistics Management Institute, 1988.

Metz, E. J., "Managing Change: Implementing Productivity and Quality Improvements," An Introduction to Quality Management: Selected Readings. Edith Goldberg, et al., eds., Navy Personnel Research and Development Center, 1987.

Naval Reserve CINCPACFLT Detachment 420, Managing the Inspection Process: A TQL Approach, 1992.

Organizational Dynamics, Inc., The Quality Advantage: Facilitator Manual, Organizational Dynamics, Inc., 1989.

Organizational Dynamics, Inc., TQA Handbook, Organizational Dynamics, Inc., 1990.

Pasmore, W. A. and Woodman, R. W., eds., Research in Organizational Change and Development. Vol 4 (anthology), JAI Press Inc., 1990.

Siegel, J. C., "Managing with Statistical Methods," An Introduction to Quality Management: Selected Readings. Edith Goldberg, et al., eds., Navy Personnel Research and Development Center, 1987.

Sink, D. S. and Acker, D. D., Quality and Productivity in Aerospace and Defense, Virginia Polytechnic Institute University, 1989.

Williams, D. W., A Guide for Implementing Total Quality Management in the U.S. Coast Guard Reserve, Master's Thesis, Naval Postgraduate School, Monterey, California, September 1991.

## INITIAL DISTRIBUTION LIST

| | | |
|---|---|---|
| 1. | Defense Technical Information Center<br>Cameron Station<br>Alexandria, VA 22304-6145 | 2 |
| 2. | Library, Code 0142<br>Naval Postgraduate School<br>Monterey, CA 93943-5002 | 2 |
| 3. | Commandant (G-ELM)<br>U.S. Coast Guard<br>2100 Second Street S. W.<br>Washington D.C. 20593-0001 | 1 |
| 4. | LT G.P. Hannifin<br>Commandant (G-CPP)<br>U.S. Coast Guard<br>2100 Second Street S. W.<br>Washington D.C. 20593-0001 | 1 |
| 4. | LT Vincent B. Atkins<br>Commandant (G-ELM)<br>U.S. Coast Guard<br>2100 Second Street S. W.<br>Washington D.C. 20593-0001 | 2 |
| 5. | CAPT Robert S. Thien<br>Commandant<br>U.S. Marine Corps (Code LPP-1)<br>Washington D. C. 20022 | 2 |
| 6. | Dr. Gail F. Thomas<br>Naval Postgraduate School<br>Administrative Sciences Deparment<br>Monterey, CA 93943-5002 | 1 |
| 7. | Dr. Susan Hocevar<br>Naval Postgraduate School<br>Administrative Sciences Deparment<br>Monterey, CA 93943-5002 | 1 |
| 8. | Mr. Bruce Pincus<br>Logistics Management Institute<br>6400 Goldsboro Road<br>Bethesda, MD 20817-5886 | 2 |