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THESIS

TOTAL QUALITY LEADERSHIP KNOWLEDGE, SKILLS, AND ABILITIES FOR SURFACE WARFARE OFFICERS

by

Eugene H. Black III

March 1994

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The purpose of this thesis was to determine the Total Quality Leadership (TQL) knowledge, skills, and abilities (KSA) that surface warfare officers will require to serve in leadership positions at sea. The study defined the TQL responsibilities that surface warfare officers will probably have during their careers in order to determine the TQL KSAs they will require. An analysis of current Navy TQL course material revealed that the KSAs being taught placed a heavy emphasis on technical skills when compared with the skills of civilian quality managers. The civilian quality managers skills and traditional leadership skills of surface warfare officers showed a fair degree of commonality in terms of the interpersonal relations, which appeared to be lacking in the Navy TQL courses. Recommendations were made to enhance the interpersonal skills in present TQL course material and to incorporate TQL into the Surface Warfare Officer School Command curricula in order to achieve a TQ critical mass in the surface warfare community. .

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Total Quality Leadership Knowledge, Skills, and Abilities
For Surface Warfare Officers

by

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Lieutenant, United States Navy
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Submitted in partial fulfillment
of the requirements for the degree of

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The purpose of this thesis was to determine the Total Quality Leadership (TQL) knowledge, skills, and abilities (KSA) that surface warfare officers will require to serve in leadership positions at sea. The study defined the TQL responsibilities that surface warfare officers will probably have during their careers in order to determine the TQL KSAs they will require. An analysis of current Navy TQL course material revealed that the KSAs being taught placed a heavy emphasis on technical skills when compared with the skills of civilian quality managers. The civilian quality managers skills and traditional leadership skills of surface warfare officers showed a fair degree of commonality in terms of the interpersonal relations, which appeared to be lacking in the Navy TQL courses. Recommendations were made to enhance the interpersonal skills in present TQL course material and to incorporate TQL into the Surface Warfare Officer School Command curriculum in order to achieve a TQ critical mass in the surface warfare community.

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I. INTRODUCTION

The Department of the Navy has embraced Total Quality Leadership (TQL) as the primary strategy for improving mission performance and readiness throughout the myriad elements that make up the Navy. This thesis examines what specific TQL training surface warfare officers require in the course of a normal career.

Dr. W. Edwards Deming developed his philosophy of quality improvement to transform the American style of management. Dr. Deming believed that improving quality reduces costs and increases productivity and market share, allowing the company to prosper and provide jobs and more jobs. [Ref. 1:p. 3]

In 1950 Japan embraced Dr. Deming's transformational way of doing business and within four years had shed its reputation for shoddy quality products and immediately began to earn ever increasing market shares around the world [Ref. 1:p. 486]. By the 1980's entire American industries had been driven out of business and a gradual awakening to the power of Total Quality Management began to occur in the United States.

TQM caught the Navy's attention for similar reasons. Navy industrial support facilities were losing massive amounts of money while still producing inferior quality work. The application of TQM principles reversed this trend and generated success stories among many of the Navy tenders,

depot maintenance facilities, shipyards, and other shore-based, support activities. Certainly this emphasis on TQM was appropriate to the management-intensive side of the Navy [Ref. 2: p. 30] The challenge remains to define Total Quality Leadership in terms applicable to the operational fleet.

In 1990, the Chief of Naval Operations, Admiral Frank Kelso, initiated the effort to expand TQM into the operational fleet as Total Quality Leadership. The establishment of TQL schools, courses, and support activities at a major operating base on each coast assisted the expansion. Presently, the Commander-in-Chief, U.S. Naval Forces Europe has embraced TQL, while the Atlantic and Pacific Fleets are still developing plans to do so. [Ref. 3]

The surface fleet composes a major portion of the Department of the Navy. On any given day approximately 45% of the fleet is underway, both deployed and operating locally [Ref. 4]. This high tempo of operations is extremely expensive for the Navy to sustain. The Navy expends approximately seven billion dollars annually to operate and maintain the ships. [Ref. 5: p. 33] To ensure the fleet derives the maximum possible benefit from the money expended, the leaders of each ship, the surface warfare officers, must know how to optimize all aspects of shipboard operations.

Elements of traditional surface warfare leadership could present several impediments to successful transformation to Total Quality Leadership. For example, in the current way

directives are issued, higher authority puts rigid clamps on the various processes involved, locking local initiative in a bureaucratic vise that makes bottom up change nearly impossible. [Ref. 2:p. 33] A culture of mission accomplishment at all costs has evolved.

Adopting TQL in the fleet units of the Department of the Navy will require a massive and concerted effort on the part of the senior Navy leadership. The single most important aspect of this effort will be the TQL training program. As this thesis will delineate, historically the Navy has had difficulty achieving effective and coherent leadership training despite numerous attempts since the Korean War.

By its very nature, the surface warfare officer community presents both obstacles and opportunities for TQL training. The unique aspects of the surface warfare career progression and training, and the psyche of the officers themselves, bears special examination in order to best define the scope and timing of TQL training for a surface warfare officer.

To overcome some of the less productive and inefficient traditions perpetuated in the surface fleet, surface warfare officers may require specific TQL training to prepare them to meet the challenges of leading in a Total Quality environment. This thesis examines what TQL knowledge, skills, and abilities are required of a surface warfare officer serving in a leadership position at sea. It will examine what education

and training is necessary, when it is required, and how it will provide the most benefits.

A. OBJECTIVES

The career paths of officers in any of the various communities may require varying elements of TQL training at different points in their careers. The purpose of this thesis is to analyze the Total Quality Leadership skills necessary for surface warfare officers in their roles as quality leaders.

B. RESEARCH QUESTIONS

The following research questions will be addressed:

1. Primary research question

What TQL knowledge, skills, and abilities are required of a surface warfare officer serving in a leadership position? This question is examined for each different level, i.e. division officer, department head, executive officer, and commanding officer.

2. Subsidiary research questions

(a) What Total Quality education and training does a surface warfare officer require to succeed in the fleet and when is it required?

(b) What are the traditional leadership skills of surface warfare officers serving in the fleet?

C. SCOPE, LIMITATIONS, AND ASSUMPTIONS

1. Scope

The focus of this thesis is limited to the surface warfare community. The data set, career path, and culture are all drawn from the surface warfare perspective and are not readily applicable to any other Navy community.

2. Limitations

The primary limitation of this thesis is the Officer Survey Instrument (OSI) data set. Although 10,000 officers were surveyed, only 301 respondents were surface warfare officers, which decreases the significance of the results. No other officer communities' data was used, which limits the applicability of these results outside of the surface warfare community. The OSI was administered in 1988, prior to the drawdown, which may reflect fewer concerns about budget management and involuntary separations from the service than would be seen in the present environment.

The amount of research that has been conducted on TQ knowledge, skills, and abilities, (KSAs) for Naval Officers, or even civilian quality managers, is quite limited. As a result the TQL KSAs for surface warfare officers are drawn from: (1) In depth analysis of the Navy course material utilized for the education and training of the TQ Team Organization, (2) Five studies of corporate quality managers and (3) information on the Air Force Total Quality Management education and training effort.

3. Assumptions

The results of the OSI data set are assumed to represent the views of the surface warfare community as a whole at all levels. Additionally, the five studies on corporate quality managers skills and characteristics are further assumed to represent those of all corporate quality managers.

D. ORGANIZATION OF THESIS

Chapter II follows with a brief history of Navy leadership training, a description of the Navy's TQL Team organization, a review of generic TQ competencies for managers, and a description of the culture of the surface warfare officer community. Chapter III reviews the research methodology used to determine the traditional leadership skills of surface warfare officers, a TQL roles matrix, and the comparison of the competencies of various quality managers. Chapter IV is a review of the relevant literature pertaining to TQ KSAs for managers. The results and analysis are presented in Chapter V. Chapter VI completes the study with conclusions and recommendations.

II. BACKGROUND

This chapter traces the recent history of Navy leadership training from the Korean War through the appearance of Total Quality Leadership (TQL). It continues with a description of the Navy's TQL organization and discusses a few essential TQL elements in detail. The chapter closes with a brief examination of the TQL education and training strategy and the culture of the surface warfare officer.

A. HISTORY OF NAVY LEADERSHIP TRAINING

The first attempt to institute leadership training, beyond that provided at the Naval Academy, came from the Secretary of the Navy with the 1958 issue of General Order 21. This order required all commanding officers to integrate leadership training with the current technical training their crews received. The Navy failed to support General Order 21 with any course material, which resulted in its widespread disregard. Despite the Navy's attempt to reissue the order in 1963, the program failed. [Ref. 6:p. 197]

The Navy adopted a more realistic leadership program in 1966. The leadership training requirements were reduced to five single topics and incorporated into General Military Training. [Ref. 7] The generally overburdened and untrained junior officers, tasked as instructors in this effort, proved incapable of providing the necessary training. A study of the entire effort concluded "...that the leadership program fell

victim to its own frills and was downgraded by Navy Institutionalists because it was a Secretary of the Navy intervention without sufficient input from line managers" [Ref. 7].

In the late 60's and early 70's as morale, retention, and race relations declined precipitously throughout the Navy, Admiral Elmo R. Zumwalt, Chief of Naval Operations, issued Z-Gram 55, establishing a task force on human resource management. [Ref. 8] The task force chose the Blake and Mouton management grid model as most applicable to the Navy and developed the Navy Optimum Means of Integrating Men and Mission (N-Man book) as a leadership training aid. The N-Man book earned significant criticism for being idealistic, simplistic, and rigid. These criticisms, combined with a lawsuit regarding the Navy's adoption of Blake and Mouton's model, resulted in dismissal of this approach. [Ref. 9: p.28]

The emergence of the Human Resource Management approach proved to be another conspicuous result of Z-Gram 55. The authority for HRM program managers "...to intervene at any level in the Navy Organization with stringent requirements for individual ship participation" elicited deep resentment among the senior grade officers and petty officers. [Ref. 7] By 1972 the unworkable nature of Zumwalt's approach became readily apparent, and steps were taken to bring the system under the chain-of-command. [Ref. 6:p. 200]

The Human Resource Management Support System (HRMSS) emerged from the earlier HRM efforts in 1973. Despite the other changes in the HRM effort, the two week leadership training program, initially known as Leadership Management Training (LMT), continued. The senior enlisted and junior officers received the training, though the course content differed significantly among each command. Like efforts that preceded and followed it, LMT lacked both clear objectives and a plan for evaluating its accomplishments. Perhaps the most telling comment about the state of leadership training in the Navy came from Representative Floyd V. Hicks, a member of the House Armed Services Committee, commenting on the committee's investigation of Navy leadership training;

> One of the most alarming features of the investigation was the discovery of a lack of leadership by middle management in the Navy. It became apparent that while junior officers, chief petty officers, and senior petty officers were performing their technical duties in a proficient manner, there was a lack of leadership in dealing with the seamen. [Ref. 10]

Admiral David Holloway relieved Admiral Zumwalt as CNO in June 1974 and immediately initiated a major review of all Navy leadership training programs. Captain Carl Auel (Chaplain Corps) found a large and growing array of leadership programs, including fifty-eight formal training courses and eleven correspondence courses costing $12.8 million a year. [Ref. 7] The report prepared by Auel proved to be a detailed analysis and a carefully designed blueprint for the development of the

Leadership, Management, Education, and Training program (LMET). [Ref. 6: p. 201]

In 1976, the Navy contracted with McBer and Company to develop the complete LMET program. The aims of the LMET program were threefold; to identify the leadership requirements of each Navy job, to establish standards by which leadership performance of each person will be judged, and to provide each member of the Navy the necessary training to develop skills when required for their next position from the time of enlistment to retirement. [Ref. 6:p. 201]

LMET provided numerous separate courses, each tailored to the upcoming assignments of students. The offerings included Commanding Officer, Executive Officer, Department Head, Division Officer, Leading Chief Petty Officer, Leading Petty Officer, and LMET instructor, with the Department Head and Division Officer courses subdivided by community. All classes were ten working days, with the exception of a twelve week instructor course.

The basis of each course was the development of sixteen core competencies, listed in Appendix A. Training included lectures, self-analysis exercises, games, role-playing, and case studies. The courses also contained behavioral science, organizational development concepts, management by objectives, and team building. The various curricula had many common elements with management development courses offered in the private sector. [Ref. 6:p. 207]

Although many thousands of personnel attended LMET courses, the effectiveness of the training remains disputed. No criteria for establishing success existed and studies conducted by Patricia G. Foley, David L. Vandover, and Theresa Cissel, were all inconclusive. [Refs. 5, 11, 12]

An offshoot of LMET was the Command Excellence Program for prospective CO/XO's. The realization that a collection of superstars did not necessarily result in superior unit performance led the Navy to investigate what produced outstanding commands. In October 1985, McBer and Company conducted extensive interviews with personnel from superior commands utilizing the Behavioral Event Interview Process (also used to construct LMET) to establish why units were able to sustain superior performance. The course presented the results of McBer's research to senior officers in seminar format as information on how commands are viewed by their personnel.

In 1989, the Chief of Naval Operations requested a plan to review Navy leadership training. The appointed task group followed a comprehensive review plan that examined all aspects of the leadership training program. [Ref. 13] As a result of this review, in May 1990, the Navy's leadership program changed from LMET to NAVLEAD. The reorganization attempts to better present the information in a sequence beginning with basic theory and finishing with intense problem solving. [Ref. 14]

B. TOTAL QUALITY MANAGEMENT AND THE NAVY

1. The Origins of TQM

Total Quality Management (TQM) is a comprehensive approach to management that goes far beyond quality control and quality assurance. It is a process that strives for continual performance improvements in terms of both quality and productivity with a focus on the customer. Other expected results include increased employee motivation with greater participation, product cost reductions, improved return on investment, and increased profit. [Ref. 15:p. xiii]

TQM is a market-driven system that applies proven performance improvement techniques to every process and operation within an organization. It involves the successful employment of business and leadership strategies to transform the organization. [Ref. 15:p. xiii]

The roots of TQM lie in the months preceding the U.S. entry into the Second World War. The War Department requested the American Standards Association develop a project on the application of statistics to the quality control of war material. The committee, including W. Edwards Deming, developed three standards based on Dr. Walter Shewart's work in analyzing variation over time, a method he called the control chart. Before the application of the new standards could be implemented, a large scale training effort was required. Dr. Deming, a student of Shewart, developed and conducted statistical quality control training for 31,000

students from the government procurement arena. [Ref. 16:p. 17]

Dr. Deming first arrived in Japan in 1947, at the request of the Department of Defense, to assist with the upcoming 1951 census. In the course of his trips to Japan he socialized with the Japanese and began a long term friendship. The Japanese Union of Scientists and Engineers (JUSE) invited Dr. Deming to teach the techniques of statistical quality control in the early fifties. The techniques he taught made significant contributions to creating quality Japanese products, but also highlighted a lack of top management attention to the quality issue. [Ref. 16:p. 18]

The visit of Dr. J. M. Juran, also at the invitation of the JUSE, marked the transition in Japanese quality control efforts from manufacturing based technology to management for total quality control. His audience consisted of 140 of the CEO's from the largest manufacturing companies in the country [Ref. 17:p. 43]. As a result Japan approached quality control as a management tool from that time on. [Ref. 16:p. 19]

To launch their quality revolution the Japanese took the following actions:

- Senior executives took personal charge of managing for quality
- Executives trained their entire managerial hierarchies in how to manage for quality

- Companies went into quality improvement at a revolutionary pace and maintained that pace year after year
- Companies trained their engineers the statistical methods for quality control
- Companies provided their work forces with the means to participate in quality improvement. The result was the Quality Control Circle
- Companies enlarged their business plans to include quality goals. [Ref. 17:p. 44]

Though neither Dr. Deming nor the philosophy's other "parent", Dr. Juran, ever referred to it as such, their approach came to be known as Total Quality Management. [Ref. 18:p. 110]

2. TQM in the Navy Shore Support Establishment

The Navy first used TQM in the mid-1980's in the industrial support side of aviation. The Naval Air Logistic Command, which provided policy and command guidance for the six huge Naval Air Rework Facilities (NARF), embarked on a transformation to TQM under the guidance of Rear Admiral John Kirkpatrick, who had become a student of Deming. NARFs repair and overhaul damaged aircraft and have an annual cost that exceeds $2 billion [Ref. 18:p. 110]. Acting as TQM's champion, the Admiral established a policy embracing the new management philosophy. He changed the NARF name to Naval Aviation Depot (NADEP), deleting the word "rework" due to its

negative connotations with TQM, and, after intense effort throughout the command, achieved a quality transformation. The initial success of Naval Air Logistic Command activities helped to rapidly spread TQM to other elements of Naval industrial facilities.

The success of this transformation is documented in part by the number of quality awards won by Navy commands [Ref. 19:p. 14, Ref. 20]:

- President's Award for Quality and Productivity Improvement
  Naval Air Systems Command (1989)
- Quality Improvement Prototype Award
  Cherry Point Naval Aviation Depot (1988, 1993)
  Norfolk Naval Shipyard (1989)
  Navy Publications and Forms Center (1989)
  Lakehurst Naval Air Warfare Center (1993)
  Keyport Naval Undersea Warfare Center Division (1994)
- President's Council on Management Improvement Excellence Award
  Norfolk Naval Aviation Depot (1990)

The tremendous and unanticipated success of TQM in the management intensive Naval industrial facilities led the Secretary of the Navy (SECNAV) to establish the Department of the Navy Executive Steering Group (DON ESG) in 1989. The purpose of the ESG was to [Ref. 21]:

- Develop DON policy and guidance on quality

- Determine overall DON vision, guiding principles, and goals in support of the Naval forces' mission
- Develop education and training strategy for the DON
- Identify and remove major impediments to quality improvement
- Develop mechanisms for evaluation of quality improvement

By 1990 TQM had gained considerable support at the highest levels in the DON, including SECNAV, in large measure due to the vision articulated by the DON ESG.

In July 1990, the CNO, Admiral Frank Kelso, issued a memorandum to all Flag Officers to initiate the effort to expand TQM into the Operating Forces. To facilitate the expansion of TQM into the Fleet, and to preclude an outright rejection of it by Navy traditionalists wary of another Zumwalt-like Human Relations Management program, the initiative was called Total Quality Leadership. In his memorandum to all Flag Officers he acknowledged the importance of and the unique role that Navy leadership plays in developing and implementing operational objectives. [Ref. 22]

The CNO defined the central theme of TQL as "...the need to identify, analyze, improve, and redesign the individual processes of our operations in order to improve and redesign the product" [Ref. 22]. The essence of TQL is embedded in the Fourteen Points developed by Dr. Deming and

listed in Appendix B. Without delving into the Fourteen Points, TQL's primary thrust is [Ref. 22]:

- Continuous improvement of quality
- Total commitment to meet the needs of the customer
- Emphasis on improving product quality through improvement of process
- Focus on leadership, training, and personnel management

TQL is beginning to achieve acceptance and success in the fleet. USS Cushing (DD-985), a Spruance class destroyer, recently implemented TQL and achieved significant success streamlining the process for updating technical documentation as she prepares to leave overhaul and return to the operational fleet. The submarine tender USS Mckee (AS-41) improved the ammunition transaction reporting process used in the Pacific Fleet through TQL. [Ref. 23] USS George Washington (CVN-73), a nuclear powered aircraft carrier commissioned in July, 1992, has embraced TQL since her christening in 1990. Other commands, including USS Kincaid (DD-965), Light Anti-Submarine Helicopter Squadron 41, and Destroyer Squadron 10, are all making the transformation to TQL. [Ref. 24]

3. The Future of TQL and Navy Leadership Training

The most recent initiative, from the Pacific Fleet TQL Office, proposes a leader development continuum, that

integrates leadership and TQL education and training. It recommends placing a greater emphasis on leadership, management, and HRM and down-playing the role of technical training. This continuum would consolidate the more than fifteen currently separate programs into a sequential and progressive curriculum, with elements that range from Navy Rights and Responsibilities, Sexual Harassment, Safety, and HIV/AIDS, to many of the core elements of Total Quality Leadership. This leadership continuum is being proposed for implementation at the Commanding Officer and Command Master Chief levels in early 1995. [Ref. 25]

C. TQL EDUCATION AND TRAINING STRATEGY

1. TQL Implementation Plan

The DoN Executive Steering Group believed that education and training would be the essential linch-pin to achieving a successful transformation. The ESG wanted to ensure an in-house capability to provide a consistent delivery of identical, high quality TQ concepts throughout the DON, at a reasonable cost. In support of the objective the ESG formed an Education and Training Advisory Group. [Ref. 26:p. iii]

The Advisory Group established the critical elements in the training strategy to support TQL implementation. These elements included [Ref. 26:p. iv]:

- DON IN-HOUSE TRAINING CAPABILITY. The DON wanted complete control of all the TQL curricula, including the instructors and instructional material.

- TRAIN-THE-TRAINER. Students trained in TQL should be able to return to their commands and be able to teach, advise, and coach their own commands.
- TOP DOWN IMPLEMENTATION. Senior Navy leaders receive TQL education and training before commands receive full TQL curriculum.
- EDUCATION BEFORE TRAINING. Education provides knowledge about TQL and training provides skills on how to apply it.
- JUST-IN-TIME SKILLS TRAINING. Provide training in methods and tools when the skills are needed to minimize decay.
- TEAM TRAINING. This approach reduces variation in learning and reinforces effective team functioning.
- INTEGRATED TRAINING. TQL courses need to be integrated with a command's TQL implementation plan and with existing training within the command training plan.
- CONTINUOUS TRAINING. Continuous training in quality concepts is vital to maintain and support continuous quality improvement.

In support of their philosophy the Education and Training Advisory Group completed several actions that established the framework for the overall TQL education and

training effort. Their most important actions included [Ref. 26:p. 9]:

- Adopting a train-the-trainer concept to ensure a critical mass within the DON receive the necessary education
- Developing guidelines for the development of a TQL curriculum
- Establishing TQL schools at Coronado, CA. and Little Creek, VA.
- Selecting and training a cadre of TQL specialists to form the faculty of the two schools

2. Critical Mass

> A critical mass is dynamic, it is simply not a majority. Critical mass is a sufficient number of influential people supporting a proposed change to give the impression of a growing formidable movement, a sense of momentum, a groundswell of interest. Critical mass describes the constituency behind a proposed change and the ability of that constituency to attract more and more support as time goes by. [Ref. 27]

Personnel selected by their commands to receive TQL training and education compose the critical mass that will lead the Navy in the implementation of TQL [Ref. 28]. The DON has identified 150,000 personnel as the number required to achieve critical mass. If 1/3 of the Navy will make up the critical mass, then middle managers, officers from the rank of Ensign to Lieutenant Commander must be a large part of it. These officers must understand and use TQL KSA's in order to translate the policies and decisions of top management into stable processes for the command. [Ref. 29]

D. TOTAL QUALITY LEADERSHIP TEAM ORGANIZATION

To further support the TQL transformation the Navy developed the TQL Team organization. Applicable to every Navy command and activity, its essential components are the Executive Steering Committee, Quality Management Boards, and Process Action Teams.

Executive Steering Committee

The ESC is the top management team, composed of managers and key leaders in an organization. It is responsible for creating the TQL transformation by developing and adopting the new quality philosophy. The philosophy is defined by the development of the Command's Strategic Plan, which includes the Vision Statement, Mission Statement, Guiding Principles and strategic objectives. The ESC provides the big-picture perspective and organizational power to support the quality transformation, including implementation guidance and removal of barriers to improvement. [Ref. 30:p. 3-5]

Quality Management Board

QMBs are composed of mid-level managers and process owners. QMBs identify the purpose, major products, customers and their needs. They also refine critical processes, and measure process results in order to analyze and improve the process within the context of the Process Management Flow Chart. Plans must take customers' requirements and their associated processes into account. They must then identify all stakeholders in a certain process and what support will be

required to achieve process stability. The QMBs charter Process Action Teams (PAT) and provide advice, resources, and delegate authority to empower PATs to make process improvement changes. [Ref. 30:p. 3-6]

Process Action Team

PATs are short term teams established by the ESC or QMBs to gather data on specific process improvements and establish stable processes. PATs are normally composed of worker level people numbering from six to ten. Once they have completed their data gathering the PAT also makes recommendations to remove causes of variation and reports results to the QMB. [Ref. 30:p. 3-9]

Team Leaders

Each team (ESC, QMB, or PAT) has an appointed Team Leader. He or she is responsible for planning and scheduling team activities, keeping the team focused, and maintaining open channels of communication between the PAT and the QMB or QMB and ESC. The Team Leader must be skilled and knowledgeable of TQ procedures. [Ref. 30:p. 3-13]

Linking Pins

The TQL team organization provides for horizontal integration of teams. The teams must also be vertically integrated, which is achieved through the downward and upward links. The vertical connection is made from the higher level team to the lower level through a member of the higher-level team. The connection from lower to higher is through the

lower team leader. For example, when linking the ESC and QMB an ESC member is the downward link. The downward link has several responsibilities which include [Ref. 21:p. 35]:

- Interpret limits of responsibility
- Attend lower-level meetings
- Communicate to prevent sub-optimization
- Help remove system impediments

E. THE SURFACE WARFARE OFFICER

1. The Culture

> Tradition has always been an important part of military life, but the Navy, much more than any of the other services, has cherished and clung to tradition. The reverence for tradition in the U.S. Navy has continued right to the present, not just in pomp or display, but in the Navy's approach to almost every action from eating to fighting. In tradition the Navy finds a secure anchor for the institution against the dangers it must face. If in doubt, or if confronted with a changing environment, the Navy looks to its traditions to keep it safe. [Ref. 31:p. 18]

If tradition is the altar at which the [surface] Navy worships, then one of the icons on that altar is the concept of independent command-at-sea, which, like the holy grail, is to be sought and honored by every true naval officer [Ref. 32:p. 18] Nowhere in the Navy is tradition more revered than in the surface community. The essential nature of what the surface warfare community does, remaining at sea off distant shores for long periods of time in support of national interests, has remained unchanged since the days of sail. Officers striving to earn their surface warfare qualification

still must master celestial navigation, basic sailing, and the ancient honors and ceremonies.

Until recently the surface warfare community suffered from severe self-image problems. The image of heavily gunned destroyers rushing about the trouble spots of the world fell victim to the reality of their vulnerability to modern, high performance cruise missiles and aircraft.

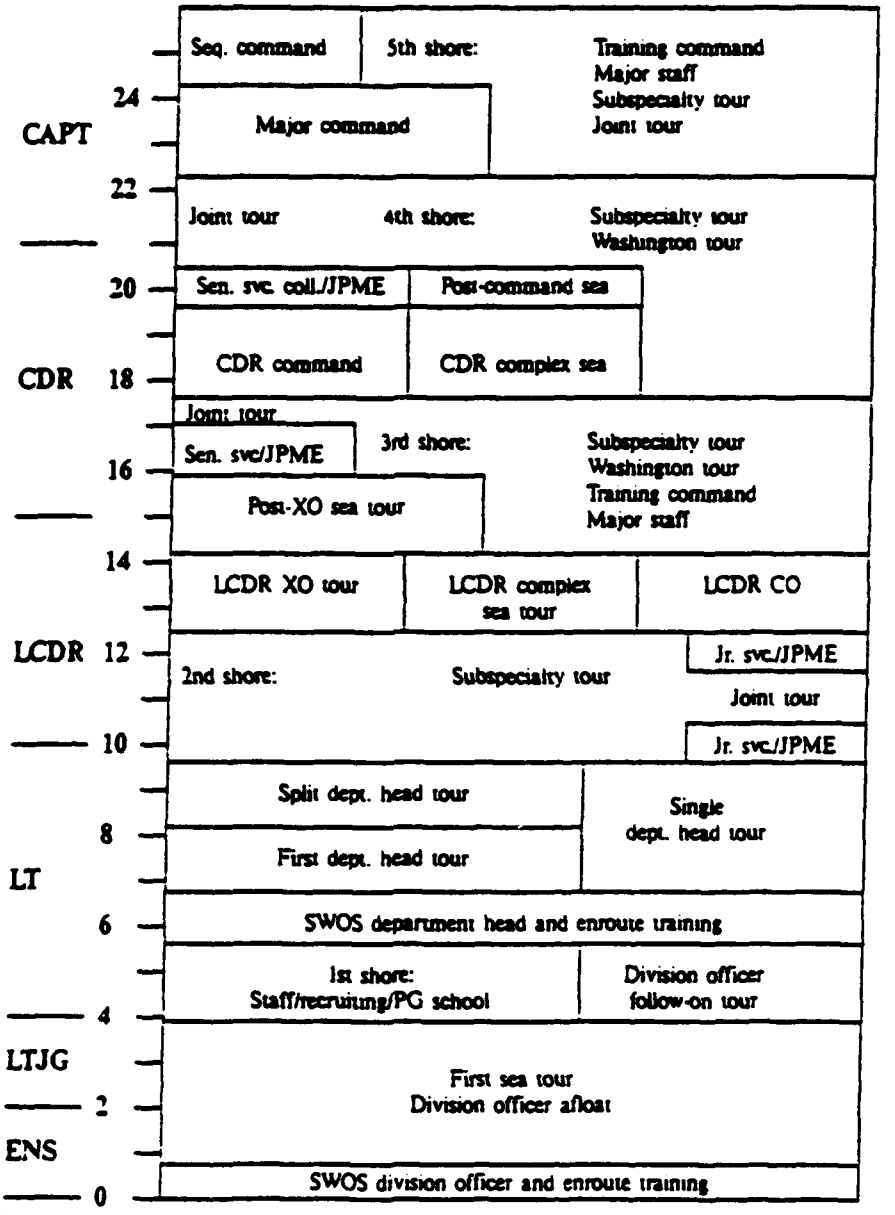
Extreme demands were placed on the officers and enlisted to keep aging steam powered warships operational with brutal working conditions. This resulted in many outstanding people choosing to leave the Navy. Many of the officers that entered the surface warfare community did not choose to do so, rather they were attrited from aviation or nuclear power training and were detailed to the surface warfare community to complete their obligations.

The late 1980's marked a sea change for the surface warfare community. The Joint Chiefs of Staff committed to six month deployments, reducing the time away from homeport for the crews, and sea pay was revised to compensate them for the demands of sea duty. The results of greatly increased ship construction spending under the Reagan Administration were large numbers of extremely capable, heavily armed, gas turbine powered warships that could sail with impunity anywhere in the world, providing anti-aircraft defense to accompanying ships or striking objectives far inshore with Tomahawk cruise missiles.

The presence of these warships and the declining Navy budget of the late 1980's and early 1990's brought the surface community to where it is today. All of the aging steam powered warships are being decommissioned. The remaining ships are far more capable, easier to maintain, and provide a better quality of life for the crew. Officers are no longer accepted into the surface warfare community that have failed out of other programs. The declining number of ships and increased automation has permitted the surface warfare community to become far more selective in choosing officers to become Commanding Officers, Executive Officers, Department Heads, and Division Officers. In the words of Rear Admiral Philip J. Coady, Director of the Surface Warfare Division, "The surface force is better equipped, better trained, and better prepared to fight and win in any environment than at any other time in history." [Ref. 32:p 1]

The traditions of the surface warfare community are also reflected in the career path, which is displayed in Table 1. Surface warfare officers shift between sea and shore duty assignments in positions of ever increasing responsibility and authority.

TABLE 1. SURFACE WARFARE OFFICER CAREER PATH



As they ascend in the chain-of-command each officer receives specialized training for their prospective sea billet at the Surface Warfare Officers School Command in Newport, R.I. Table 1 depicts the division officer and department head

courses. Although not shown, all prospective Commanding Officers (PCOs) attend the Senior Officer Shipboard Marterial Readiness Course (SOSMERC) immediately following their third shore tour, and prior to the Commander Command tour. Executive Officers (PXOs) also attend the PXO course immediately following the second shore tour and prior to the LCDR XO tour.

SWOS, as it is known in the surface warfare lexicon, is the most respected training command in the surface warfare community. Since its origin as "Destroyer School", it has had a reputation for providing demanding, up-to-date, and vital training to surface warfare officers. The curriculum taught at SWOS sets the agenda for each generation of prospective COs, XOs, Department Heads, and Division Officers that graduate and move into operational billets at sea.

2. Current TQL Education

Surface warfare officers do not currently receive much TQL training via their current career progression. While assigned to SWOS, Prospective Commanding Officers (PCOs) receive a two hour introduction, while PXO's receive a twenty hour course. The Department Heads and Division Officers receive eight and one hours of instruction respectively. [Ref. 33] Once assigned to their ships the extreme demands placed on their time by the operational commitments, inspections, and duty generally preclude attendance at schools of any length greater than one week.

TQL training offered through the various accession programs varies considerably. The Naval Academy has integrated TQL into all aspects of its leadership training and professional development, including classroom training and TQ projects relating to processes at the Academy. [Ref. 34] The NROTC and OCS only offer brief introductory courses, while requiring no participation or actual course work [Ref. 35, 36].

Graduate level TQL training is rather limited. The only TQL courses offered at the Naval Postgraduate School are elective, and many students do not have any electives in their curricula. The Naval War College offers one elective course per year for both the senior and junior course. [Ref. 37]

III. METHODOLOGY

This chapter describes the methodology used to determine the Total Quality and traditional leadership knowledge, skills, and abilities necessary for a surface warfare officer to succeed in a Fleet Total Quality environment. The first section reviews the Officer Survey Instrument and what information it provides. The second section details the procedures used to analyze the information from the OSI survey data. The third section explains the methodology for comparing Total Quality KSAs for managers identified in seven different studies. The methods for determining the roles and responsibilities of the surface warfare officer within the TQL organization, and the KSAs of TQ team members complete the fourth section. The final section of the chapter explains the analytical framework for developing the surface warfare officers Total Quality KSAs.

A. THE OFFICER SURVEY INSTRUMENT

The OSI data was used to determine if any traditionally important KSAs are applicable in a TQL environment. The Navy Occupational Development and Analysis Center (NODAC) developed the Officer Survey Instrument (OSI) based on a validated civilian survey, the Professional and Managerial Position

Questionnaire (PMPQ) developed by Drs. Ernest J. McCormick and Jimmy L. Mitchell. [Ref. 36] The survey consists of four sections:

- Billet information
- Personal and background information
- Management and professional responsibilities
- Leadership

The survey gathered data on common managerial functions and general position responsibilities that cross all Navy communities. It was designed to establish a comprehensive officer occupational data base and occupational analysis program. [Ref. 36]

1. Billet Information.

This section, completed by the command personnel office, provided ship or station activity, command status, and specific manpower data relating to billet coding and requirements.

2. Personal and Job Background Information.

This section contained information relating to the background of the respondent, including rank, time in rank, designator, and education. It continued with questions relating to the number of subordinates and their grades. The final segment defined the respondents responsibilities. These include job title, (from a long, detailed attached list), average work week in-port and at sea, watch time, meeting time, and collateral duties.

3. Management and Professional Responsibilities.

The third section of the OSI asked thirty two-part questions covering the full range of management and professional responsibilities. Part A of each question asked to what extent a specific task is a part of the current job on a scale from zero (does not apply) to nine (a major focus of the job). Part B asked for an assessment of the complexity of the task performed in part A, also on a scale from zero (does not apply) to nine (extremely complex), with examples of specific tasks typical of each odd-numbered complexity level. Questions dealing with watch-standing responsibilities, physical fitness, and professional development completed the section.

4. Leadership

The final section of the OSI dealt solely with leadership. This segment includes questions regarding division of time among leadership, management, and technical tasks, frequency of interactions with peers, superiors, and subordinates, and the importance of the interactions to the current job. The survey concluded with seven questions based on LMET core competencies and their importance to the job.

5. Survey Respondents

NODAC mailed the survey to 10,000 Navy officers in all communities from the rank of CWO2 to O-6. There were 7,381 usable surveys returned before the survey was closed out in December of 1988, and the responses became the OSI database. [Ref. 37]

B. PROCEDURES

In order to extract the surface warfare officers from the sample, all respondents with designators other than 1110/1115, regular/reserve surface warfare officer, 1160/1165, regular/reserve surface warfare candidate, and 1210 surface warfare material professional, were deleted. A sample of all surface warfare officers and candidates remained. This data was then sub-divided based on rank, billet, and command assignment, into one of four experience levels, corresponding with Division Officer, Department Head, Executive Officer, and Commanding Officer. The result listed all surface warfare officers in the OSI data set grouped by experience level. Based on the command assigned and its status, the entire set was then further divided into two sets based on sea or shore duty.

A means table was conducted for all the survey questions for both the sea and shore sub-sets. This provided a complete listing of the mean response to each question by experience level. From these results, lists were constructed of the management and professional responsibilities, and leadership skills most important to each of the different levels.

C. TOTAL QUALITY KNOWLEDGE, SKILLS, AND ABILITIES FOR MANAGERS

To determine the Total Quality KSAs of managers several comparisons were conducted of seven separate studies that

detailed specific characteristics of quality managers. The seven studies utilized were:

- The Transformational Leader by Noel M. Tichy and Mary Anne Devanna
- Charting the Course to Command Excellence by Leadership Division of Naval Military Personnel Command
- Air Force Total Quality Management
- Voices From the Field by The Association For Quality and Participation
- Quality Professional Development by Linda Merritt
- The Competencies of the Total Quality Leader by William R. Bryant and Stepen D. Coine
- Results of Most Important Management and Professional Responsibilities for Surface Warfare Officers from OSI survey

The comparisons were made in matrix format. The studies were listed on the horizontal axis with the KSAs of each study listed on the vertical axis. The resulting matrices provide a precise illustration of the quality manager KSA commonalities among the studies.

D. SURFACE WARFARE OFFICER TOTAL QUALITY ROLES

To determine the TQL roles of a surface warfare officer a thorough review was conducted of the Navy TQL course material, particularly the Senior Leader Seminar. The review provided recommendations on the composition of the most

important quality teams. Again a matrix was constructed with the experience level across the horizontal axis and the quality teams listed along the vertical. Each cell was then coded either blank, indicating no role, or with a "P" or "O" denoting probable or occasional responsibility.

E. TQL TEAM TRAINING

The education and training necessary for the TQL teams was based on data collected from interviews with Dr. Stephen Dockstader, Senior Scientist at the Navy Personnel Research and Development Center. He specifically defined the education and training in terms of the TQL courses required for a team member to function adequately.

TABLE 2. ESC, QMB, AND PAT MEMBER RECOMMENDED TQL COURSES

	QMB	ESC	PAT
Fundamentals of TQL	X	X	X
Methods for Managing Quality	X	X	
Systems Approach to Process Improvement	X		

Table 2 lists each of the TQL teams and the courses recommended for each member. The course guides provided for all TQL courses contain all the information necessary to serve as both textbook and reference for the student. The most essential KSAs were distilled from the relevant course guides and are presented as the TQL KSAs for each team. It is

important to note that the course, Team Skills and Concepts, was not identified as recommended.

F. COMBINING THE ELEMENTS

After presenting all the information gathered in each section, the study followed a logical progression to fuse the disparate elements into a single coherent framework for analysis. The specific KSAs developed from the Navy TQL course material were analyzed against the framework of the KSAs derived from the literature review of TQ managers. An identical analysis was conducted utilizing the OSI survey results. The final product is an accurate portrayal of the focus, strengths, and weaknesses of Navy TQL training for surface warfare officers.

IV. TOTAL QUALITY KSAs FOR MANAGERS: THE LITERATURE

This chapter reviews six different studies of highly successful managers which specify certain KSAs and attributes that contributed to their success in both TQ and traditional environments. The background and results of each effort are presented. The OSI survey results are omitted due to their consideration in Chapters III and V.

A. QUALITY PROFESSIONAL DEVELOPMENT

The author, Linda Merrit, Quality Planning Manager for AT&T, presented this report at the Association for Quality and Participation 15th Annual Spring Conference in New Orleans, Louisiana. The study defined a quality professional, (the AT&T equivalent of a quality manager), as "... Anyone who spends a significant portion of their time providing Total Quality Management support services such as consulting, facilitating, coaching, and training to individuals, teams, and organizations." [Ref. 38]

The size of AT&T, approximately 300,000 employees organized into over forty business divisions worldwide, results in a full range of quality management functions and a variety of structural approaches to quality. Each division essentially has its own approach to quality. Within each division, Quality professionals are heavily involved in policy deployment, while others structured around process management efforts, and focusing on quality improvement teams.

Some divisions field many quality professionals supporting all levels of line management and quality teams. Others have chosen a few highly placed Quality professionals advising upper management on quality strategy. Most quality professionals report directly to a local line manager and receive indirect support from the quality managers hierarchical network. In several divisions quality professionals report to a quality department where they are "contracted" out as necessary to the line organizations. The success of each configuration varies depending upon the level of management leadership and support.

In fall 1991, a cross-division team of quality professionals was formed to develop a competency model for use in guiding selection and development of quality professionals at AT&T. The study was based on the work of Dr. William R. Bryant who published the Total Quality Leader Study, in 1990.

Data was gathered through a process utilizing five focus groups and a survey. Information gathered from the focus groups held with quality professionals was folded in with other AT&T material, to create a survey that clarified and prioritized the tasks identified as most critical for effective performance of quality professionals. The survey also identified accountable standards for the quality professional, and key attributes to carry out critical tasks successfully. One hundred AT&T quality professionals of all

salary grades and twenty different divisions participated in the study.

The study identified twenty-five key attributes that define the core set of quality professional capabilities most applicable across the entire AT&T community. These attributes are outlined in Table 3.

TABLE 3. AT&T QUALITY PROFESSIONAL MODEL KSAs

Commitment to Quality • Customer Orientation • Commitment to Quality values • Tolerance for uncertainty	Professional Credibility • Professional self-image • Integrity • Self-Confidence • Business Savvy • Building Credibility • Team Player
Process Orientation • Conceptualizing • Systems orientation • Organizational awareness • Data gathering • Analysis • Forward thinking • Good judgement • Implementing	Developing/Influencing Others • Accurate empathy • Political awareness • Influence strategizing • Communicating • Empowering others • Team building • Multiple influence Skill

B. THE COMPETENCIES OF THE TOTAL QUALITY LEADER

Dr. William R. Bryant and Stephen D. Coine wrote this study for the AQP Spring Conference Transactions in 1991. The object of the report was to pinpoint the competencies of TQ leaders who the authors defined as "...The watch dog for quality and customer satisfaction". [Ref. 39] The TQ leaders goal "...Is to help the organization attain total customer satisfaction and continuously improve its product and quality."[Ref. 39]

The participants were fourteen senior managers from thirteen different corporations. The only requirement to participate was that the person had to have a significant role in implementing quality. Each participant was identified by their company as a Total Quality Leader.

The study used a "data-based interview" of two to four hours to gather information on how participants operated within their organizations. Each interview focused on "Key-Events". When probed in detail, these events, either high or low points in each individual's career, revealed the knowledge, skills, and abilities that made them successful managing in a certain situation.

Interviews were transcribed and reviewed by two researchers, operating from two different perspectives. One perspective related to describing the job itself, the other identified specific competencies, traits, and skills demonstrated during the key events.

The results provided a general description of the quality leaders job and a core set of characteristics. Again four groups of competencies distinguished the total quality leader, these are presented in Table 4.

TABLE 4. TOTAL QUALITY LEADER COMPETENCIES

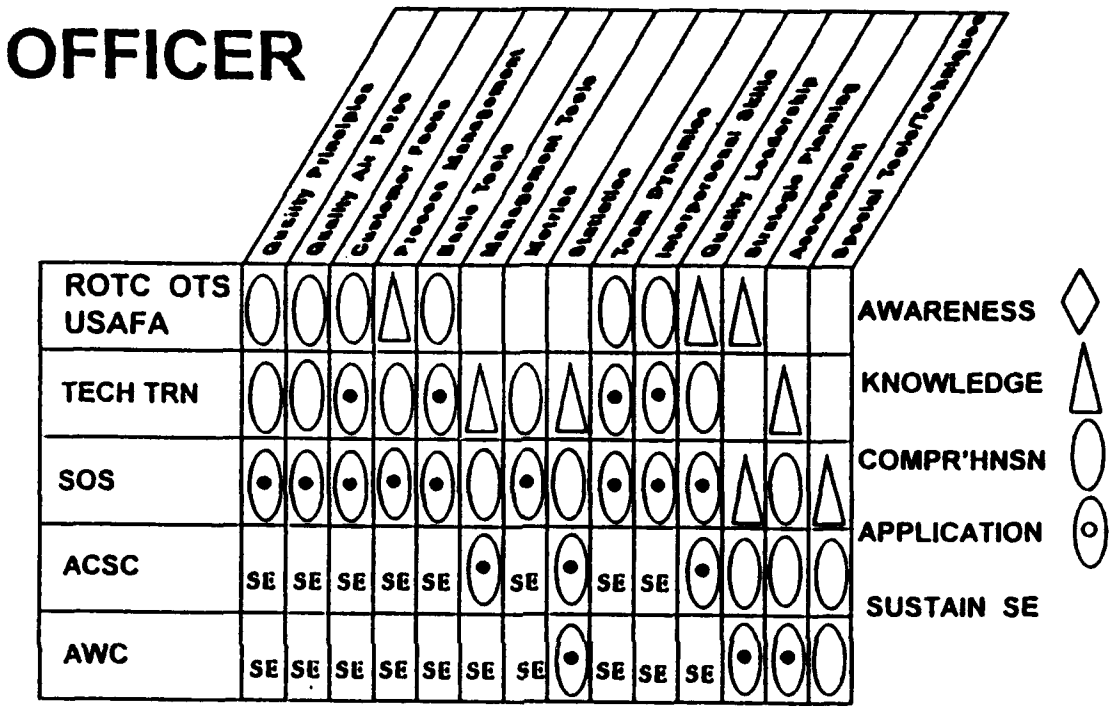
Professional Sophistication • Leader self-image • Socialized power • Concern for credibility • Political astuteness • Interpersonal awareness • Business Savvy • Tolerance for uncertainty • Pragmatic	Change Agent • Self-Confidence • Organizational Diagnostic Skill • Building Vision • Communication Skill • Team Development Skill • Influence Skill • Empowering Skill
Quality Drive • Customer Orientation • Commitment to Quality Values • Goal/Measurement Drive	Process Orientation • Systems Orientation • Conceptual Ability • Targeted Data Collection Skill • Analytical Skill • Implementation Skill

C. AIR FORCE TOTAL QUALITY MANAGEMENT

The Air Force, like the Navy and the other services, has undertaken a TQM initiative. To support its effort to embrace the transformational way of doing business, the Air Force Quality Institute was established.

The Air Force Quality Institute developed a very specific matrix of TQM KSAs which are directly linked to the major career educational milestones for the officer corps. That matrix is presented in Table 5. The topics included in the headings along the horizontal axis of Table 5 are listed in Appendix C. Although strict adherence to the matrix has not been mandated, the Air Force is moving in that direction. [Ref. 40] Currently only two thirds of the officer corps receives all of the TQM education and training recommended through resident courses, the remainder complete their TQM education through correspondence courses.

TABLE 5. AIR FORCE TQM KSAs MATRIX



Certain elements of Table 5 require further explanation. Initial TQM education and training is provided through the Air Force Academy (USAFA), Officer Training School (OTS), and Reserve Officer Training Corps (ROTC) prior to commissioning. The second stage of TQM education is conducted during technical training. An officer receives this training upon commissioning in their area of specialization, (for example pilot training, strategic missile training, etc. etc.) The third stage of TQM training commences at the Squadron Officer

School (SOS). This school is designed for captains (O-3) with five to seven years service, as they prepare to move into middle-management positions in the Air Force. At this level, as shown in Table 5, the officer is expected to apply a wide range of TQM KSAs, that previously only required knowledge or comprehension. The fourth level of Air Force TQM training is the Air Command and Staff College (ACSC). It is intended for majors (O-4) with ten to twelve years service, who are expected to be able to function on an Air Force Quality Council, (generally comparable to Navy QMBs). The final stage of TQM training and education is at the Air War College (AWC). This level is intended for colonels and lieutenant Colonels who are expected to serve on ESCs and conduct strategic planning.[Ref. 40]

D. VOICES FROM THE FIELD: UNCOVERING THE DYNAMICS AT WORK IN THE QUALITY AND PARTICIPATION MOVEMENT

This study was conducted by the Association for Quality and Participation (AQP) in 1993. The AQP conducted the research to explore three specific areas:

- The types of roles in the field and the skills needed for effective quality and participation practice
- Who practices now and what activities they are involved in
- Whether there are distinct career paths and levels of expertise in the field.

Data was collected through a 150 question survey, mailed to a random sample of 1500 AQP members and 1500 non-members who had contact with AQP through other activities.

Respondents included career quality professionals and those who incorporated it into their workday. A total of 711 people responded, including 22% upper, 27% mid-level, 30% exempt professionals, 10% non-exempt professionals and 11% first line supervisors. The majority of the respondents worked in manufacturing (51%), service industries including hotels and health care (16%), transportation and utilities (13%), public administration and government (9%) with a mixture of others. Fifty-five percent of the respondents worked in organizations with greater than 1000 employees, and 31% worked in organizations with less than 500 employees.

The survey results provided the means for AQP to identify the KSA areas that practitioners at all levels and in all types of organizations need to master in order to make their quality and participation efforts a success. [Ref. 41] The KSAs included:

- Inspiring Change
- Facilitating Teams
- Training
- Process Planning and Improvement
- Satisfying Customers
- Promoting Quality and Participation
- Designing Involvement Systems

- Using Statistics
- Involving Unions
- Assessing Quality Systems
- Auditing

E. THE TRANSFORMATIONAL LEADER

The purpose of this book, written by Noel M. Tichy and Mary Anne Devanna in 1986 and updated in 1990, was "...To spread a new way of thinking about corporate transformation, to make true leadership an everyday way of acting rather than a talent limited to a few select individuals." [Ref. 42:p. xiii] The authors were motivated by the slow awakening of corporate America to the aggressive Japanese economic challenge to America.

The book utilized an interview methodology with various "transformational leaders". The data was gathered through a series of interviews varying in length from a few hours to a few days. The interview and book subjects were fourteen upper-level managers that met four separate criteria.

- Involved in a major overhaul or transformation of an existing organization
- Self-acknowledged change agents who defined themselves and their criteria for success in terms of fundamental change of their organizations
- Leaders of organizations accessible to the authors to conduct interviews and assemble case material
- Known personally or by reputation to the authors

The success or failure of the leaders studied was unknown when the book went to print. Their importance stemmed from their attempts to conduct transformations within organizations they were responsible for. The authors chose to provide their observations and insights immediately, rather than take several years collecting data. The transformational leaders examined represent some highly successful and respected American corporations. These include:

- Michael Blumenthal, (former Secretary of Treasury in the Carter Administration), CEO of Burroughs/Unisys Corporation
- J. Jeffrey Campbell, Burger King
- Alex Cunningham, LLoyd Ruess, and Robert Stempel, General Motors
- Frederick Hamm, Chase Manhattan Bank
- John Harvey Jones, Imperial Chemical Industries
- Lee Iacocca, Chrysler Corporation
- Mary Ann Lawlor, Drake Business Schools
- Don Mackinnon, Ciba-Geigy
- James Renier, Honeywell
- Jack Sparks, Whirlpool Corporation
- Edward Thompson, Schneider Transportation
- Jack Welch, General Electric

The results of the research were examined in detail in the 270 page book. The section of most interest to this

thesis examined the characteristics of transformational leaders. The leaders examined in this book displayed a number of common characteristics. These leaders:

- Identified themselves as change agents.
- Acted as risk takers, taking prudent stands as courageous individuals
- Believed in people. Not dictators, work toward empowerment of others
- Were value driven. Articulated a core set of values
- Made mistakes, but were life long learners and unafraid to fail
- Had ability to deal with complexity, ambiguity, and uncertainty
- Dealt skillfully with issues of a cultural, political, and technical nature
- Provided vision, were able to dream, and translated their dream to words and shared it with others

F. CHARTING THE COURSE TO COMMAND EXCELLENCE

This study was produced by the Leadership Division of the Naval Military Personnel Command in 1985. Although it did not focus on TQ, it is relevant because it delineates specific characteristics of officers serving in outstanding naval commands. The Navy asked McBer Company, the original consultants for the LMET program, to assess the viability of changing the individual focus of LMET to an organizational

focus to try and discover the competencies that distinguish superior commands from average ones.

The methodology employed by McBer basically recreated that of the LMET study, but with an organizational, vice individual, focus. The superior commands that participated had to meet the following criteria:

- Won the Battle E or runner up
- Won a departmental E
- Passed all major operational readiness inspections or exercises
- Maintained command retention at a level equal to or above fleet average
- Maintained a strong safety record
- Had a general reputation for being outstanding, as confirmed by flag officers in the chain of command

Twenty-one units were studied: six superior and three average air squadrons, three superior and three average submarines, and three superior and three average surface ships. The studies took up to five days per unit and included two hour structured interviews with the CO, XO, Department Heads, Command Master Chief, Chief of the Boat, and six or seven Chief Petty Officers.

The researchers also conducted group interviews with junior officers, chief petty officers, petty officers, and non-rated seamen. These interviews included questions on the

CO, XO, their relationship, the Wardroom, CPO mess, planning activities, and communications. They also observed a wide range of command activities ranging from FOD walkdowns to preventive maintenance, Captains Mast, awards ceremonies, briefings and inspections. Further information was gathered through a survey and command information questionnaire.

The results of the research provided the full range of excellent command characteristics. These were focused in three areas; people, relationships, and activities. The most relevant results dealt with officer characteristics and are presented in the following section.

The outstanding Commanding Officer characteristics were:

- Targets key issues
- Gets crew to support command philosophy
- Develops XO
- Staffs to optimized performance
- Gets out and about
- Builds esprit de corps
- Keeps his cool
- Develops strong wardroom
- Values chiefs quarters
- Ensures training is effective
- Builds positive external command relationships
- Influences successfully

The outstanding Executive Officer displayed characteristics that included:

- Drives administrative system
- Is active in planning
- Is key to unit staffing
- Gets out and about
- Ensures standards are enforced

In the area of the CO-XO relationship the following characteristics were highlighted:

- CO is in charge
- XO stands behind CO's philosophy and policies
- Co and Xo have complimentary and well defined roles
- Communicate frequently
- Respect each others abilities

The characteristics of the outstanding wardroom included:

- Cohesive
- Matches CO-XO leadership
- Raise concerns with CO and XO
- Take initiative
- Does detailed planning
- Takes responsibility for work-group performance

G. SUMMARY

The six studies examined successful leaders and identified some of the KSAs and characteristics that enabled them to provide success to their organizations. The broad range of characteristics identified are compared in further detail in Chapter V.

V. RESULTS AND ANALYSIS

This chapter details the results of this study in five distinct sections. The first section provides the surface warfare officer TQ roles and responsibilities. The second section reviews the KSAs for QMB, ESC, and PAT members. The third section presents a comparison of TQ manager KSAs. The fourth section provides the more traditional leadership and management skills for surface warfare officers by experience level. The final section combines all the elements of the previous sections for analysis.

A. SURFACE WARFARE OFFICER TQ ROLES

Although every ship will differ slightly, the analysis conducted of TQ roles represents a generic shipboard TQL organization. Table 6 displays the probable and occasional TQ roles of each surface warfare officer by experience level. At every level the surface warfare officers have multiple TQ roles. Each of these roles logically matches the experience level and responsibilities of the corresponding officer.

The Commanding Officer, as is to be expected, will lead the overall TQ effort as the ESC Team Leader. Traditionally the CO has in large measure personified the ship. In a TQ environment this remains true, because the Commanding Officer's vision is the ship's vision, and he will lead the ESC efforts to support TQ practices and strategic planning.

TQ cannot succeed in any ship without the active support of the Commanding Officer.

TABLE 6. SURFACE WARFARE OFFICER TQ ROLES BY EXPERIENCE LEVEL

	Division Officer	Department Head	Executive Officer	Commanding Officer
Executive Steering Committee		P	P	P
Quality Management Board	P	O		
Process Action Team	O			
QMB Linking Pin		P	P	
PAT Linking Pin	P			

P = Probable Assignment, O = Occasional Assignment

The Executive Officer role complements that of the CO. As the second-in-command, administrative leader, and CO sounding board, the XO will be a primary member of the ESC, and also a QMB Linking Pin from the ESC. QMBs chartered to examine administrative or habitability processes are examples of QMBs of concern to the XO. An XO is well suited for the role because they set their own daily schedule and are not subject to the same operational demands of handling a ship at sea as the CO. Their flexibility permits them to get more closely involved with the overall TQ effort, changing priorities and focus as necessary to best support the mission and the CO's priorities.

The Department Heads shoulder a considerable TQ burden. As the primary process owners, with operational obligations to the CO and administrative to the XO, they are essential to the functioning of the ship, and thus serve primary roles on the ESC and as QMB Linking Pins. The Department Heads, benefitting from direct reporting responsibilities to both the CO and XO, must act as the communication link between the ESC and most QMBs. As the process owners, they may assist Division Officers leading QMBs and occasionally may be required to lead one themselves.

The Division Officer also plays a crucial role in the TQ Team Organization. Their primary responsibilities will be serving on QMBs and acting as Linking Pins to PATs. Their position "on the deckplates," dealing directly with the Chief Petty Officers and the enlisted, provides extreme latitude to assist and guide the efforts of a PAT team in the role of Linking Pin.

B. TQ TEAM ORGANIZATION KNOWLEDGE, SKILLS, AND ABILITIES

From the preceding examination of Table 6, it becomes clear that the QMB KSAs, detailed in the next section, are essentially mandatory for all Executive Officers, Department Heads, and Division Officers serving at sea. To fulfill their TQ roles as members of QMBs, PATs, and the ESC, surface warfare officers require specific TQL courses as delineated in Table 2. As noted in Chapter III, the KSAs were extracted from an analysis of each course's objectives and course

content. These KSAs for each team member are detailed in Appendix D due to their length and complexity. However their essence is provided here. [Ref. 28, 45, 46]

An ESC, QMB, and PAT team member should:

- Recognize the basic principles of TQL
- Appreciate the usefulness of TQL concepts to future work in the DON.
- Gain knowledge required to begin to understand the principles of TQL

Additionally ESC and QMB members should be able to:

- Describe the DON's approach to TQL to ensure system optimization
- Identify own role as part of the critical mass
- Use TQL tools and techniques to identify customers and their needs
- For each critical process, identify the major products/services provided
- Identify, manage, and improve critical processes using TQL tools and techniques

A QMB member should have the ability to:

- Help the organization optimize the performance of its extended system
- Teach, guide, and advise organizational teams in ways to optimize performance

- Identify and prioritize stakeholders
- Identify areas for improvement
- Plan how to make improvements, carry out plans, and evaluate results
- Develop appropriate measurement systems
- Use the seven basic graphic tools appropriately

As the TQL education and training system is currently designed, attainment of just these KSAs requires in excess of 120 hours of classroom instruction at the operating unit.

C. TOTAL QUALITY MANAGER SKILLS COMPARISONS

The Quality Managers comparison matrix facilitates a rapid and accurate comparison of the KSAs of managers from eight different studies. Five of these, AOP Voice From the Field, AT&T Quality Professional Key Attributes Model and Most Important Tasks, Competencies of the TQ Leader, and Air Force TQM, are based entirely on and detail KSAs focused completely on the use of TQ methods for managing organizations. The remaining three studies, Command Excellence, The Transformational Leader, and OSI Command Level Survey results are not based on TQ but rather on more traditional aspects of leading and managing organizations. Both the Command Excellence study and OSI Survey were conducted prior to the advent of TQL in the Navy. The Transformational Leader may be from a traditional or a TQ organization, but the key is the KSAs the study utilized to effect changes and capture success.

The most striking aspect of the comparison is the high degree of commonality across all the studies, despite the disparate points of view from which they were approached. Although twenty-four different KSAs were listed, five or more of the studies agreed on ten separate KSAs.

These common KSAs, appearing in at least five of the eight studies were:

- Communicating
- Empowering others
- Influence skills
- Inspiring change and building vision
- Process planning and improvement
- Organizational awareness
- Satisfying customers
- Positive and forward thinking
- Facilitating teams
- Promoting quality

The common KSAs concentrate on abilities that assist the leaders in interacting and dealing with people. Only one KSA, process planning and improvement, centers on technical ability. Based on these results, one must conclude that quality managers must have far more than just technical competency to succeed in their roles. They must have a wide range of highly refined interpersonal skills that enable them

to achieve their goals for the company through multiple strategies for influencing people.

TABLE 7. TQ MANAGERS KSA COMPARISON MATRIX

	AQP Voices from the Field	AT&T Quality Professional Key Attributes Model	AT&T Quality Professional Most Important Quality Tasks	Competencies of the Total Quality Leader	Transformational Leader Characteristics	Command Excellence Outstanding Commanding Officer	OSI Survey Results Command Level	Air Force TQM Command Level
Inspiring Change Building Vision	●		●	●	●	●		
Process Planning and Improvement	●	●	●	●			●	●
Organizational Awareness		●	●	●		●		●
Assessing/Auditing Quality Systems	●	●		●				●
Satisfying Customers	●	●	●	●				●
Group Problem Solving	●							●
Positive/Forward Thinking		●	●	●	●	●	●	●
Involvement System Design	●							
Involving External Organizations	●					●		
Tolerance for Uncertainty		●		●	●			
Using Statistics	●			●				●
Implementing		●		●		●	●	
Facilitating Teams	●	●	●	●		●		●
Training	●		●			●	●	
Conceptualizing		●		●				●
Promoting Quality	●	●	●	●	●			●
Good Judgement		●					●	
Credibility		●		●				
Self-Confidence		●	●	●	●			
Integrity		●	●		●			●
Communicating		●	●	●		●	●	●
Empowering Others			●	●		●	●	●
Influence Skills			●	●		●	●	●
Inspections							●	

D. TRADITIONAL LEADERSHIP AND MANAGEMENT SKILLS

The OSI survey results provide insight into the leadership skills, managerial, and professional responsibilities considered most important by surface warfare officers serving in billets at sea. These results are important for determining if any traditional leadership KSAs are applicable in a TQL environment. The results are presented and analyzed by experience level and combined into a matrix for comparison.

1. Commanding Officer

The Commanding Officer OSI survey results highlighted the leadership skills and abilities that led these officers to command-at-sea. The judgement of an officer in command of a warship and several hundred sailors is probably the most essential element to their success, and that is amply reflected in the results. Judgement involving people and operations were considered their most important abilities. The importance placed on inspection preparation skills, greater than communications, interacting, or developing subordinates reflects the extreme level to which inspection results impact the Commanding Officers and their careers.

TABLE 8. COMMANDING OFFICERS' TEN MOST IMPORTANT LEADERSHIP SKILLS, MANAGERIAL, AND PROFESSIONAL RESPONSIBILITIES BASED ON OSI RESULTS

- Judgements involving people
- Judgements involving operations and objects
- Supervising and directing
- Inspection preparations
- Oral communications
- Interacting
- Written communications
- Sense of responsibility
- Coordinating
- Developing subordinates

2. Executive Officer

The role of the Executive Officer at sea is well reflected in the OSI results. Clearly an XO spends the majority of their time planning, supervising, and directing, making heavy use of their skills in these areas as well as communication. These leadership and management skills dovetail well with inspection preparation, predeployment planning, and manpower planning responsibilities. The importance of an XO's judgement reflects their role as the CO's sounding board.

TABLE 9. EXECUTIVE OFFICERS' TEN MOST IMPORTANT LEADERSHIP SKILLS, MANAGERIAL, AND PROFESSIONAL RESPONSIBILITIES BASED ON OSI RESULTS

- ORAL COMMUNICATIONS
- PLANNING AND SCHEDULING
- PREDEPLOYMENT PLANNING
- INSPECTIONS PREPARATIONS
- MANPOWER PLANNING
- COORDINATING
- JUDGEMENTS INVOLVING OPERATIONS AND OBJECTS
- INTERACTING
- ADVISING
- SENSE OF RESPONSIBILITY

3. DEPARTMENT HEAD

The Department Head results also reflect the areas expected that require skills and competency. The majority of a department heads communication to their division officers and chief petty officers will be oral and they must by highly skilled to succeed. The importance of their responsibilities for pre-deployment planning also requires skills in written communications, coordinating, planning and scheduling, and interacting. The importance of initiative and persistence become particularly apparent when considering the breadth of responsibility Department Heads are held accountable for.

TABLE 10. DEPARTMENT HEADS' TEN MOST IMPORTANT LEADERSHIP SKILL, MANAGERIAL AND PROFESSIONAL RESPONSIBILITIES BASED ON OSI RESULTS

- ORAL COMMUNICATIONS
- PREDEPLOYMENT PLANNING
- SUPERVISING AND DIRECTING
- WRITTEN COMMUNICATIONS
- COORDINATING
- INITIATIVE
- PLANNING AND SCHEDULING
- INTERACTING
- PERSISTENCE
- RESPONSIBILITY

4. DIVISION OFFICER

The importance of oral communication is again highlighted in the Division Officer results. The relationship between a young and inexperienced officer and an older Chief Petty Officer will succeed or fail based on the Division Officer's ability to communicate with the Chief. Most Division Officer supervising and directing occurs through the Chief, but will still tax the persistence of a junior officer. The high importance Division Officers place on judgements involving people is surprising and may reflect their inexperience in an area not often called upon in an academic and training environment.

TABLE 11. DIVISION OFFICERS' TEN MOST IMPORTANT LEADERSHIP SKILLS, MANAGERIAL, AND PROFESSIONAL RESPONSIBILITIES BASED ON OSI RESULTS

- ORAL COMMUNICATIONS
- SUPERVISING AND DIRECTING
- PERSISTENCE
- JUDGEMENTS INVOLVING PEOPLE
- INITIATIVE
- TEAM BUILDING
- RESPONSIBILITY
- WRITTEN COMMUNICATIONS
- PLANNING AND SCHEDULING
- POSITIVE AND REALISTIC EXPECTATIONS

5. COMPARISON OF EXPERIENCE LEVELS

TABLE 12. COMPARISON OF LEADERSHIP SKILL, MANAGERIAL, AND PROFESSIONAL RESPONSIBILITIES BASED ON OSI RESULTS

	Commanding Officer	Executive Officer	Department Head	Division Officer
Supervising and Directing	●	●	●	●
Manpower Planning		●		
Predeployment Planning		●	●	
Planning and Scheduling		●	●	●
Inspection Preparations	●	●		
Judgements on Ops and Objects	●	●		
Judgements on People	●			●
Developing Subordinates	●			
Realistic Expectations				●
Responsibility	●	●	●	●
Interacting	●	●	●	
Coordinating	●	●	●	
Initiative			●	●
Advising		●		
Persistence			●	●
Team Building				●
Communications	●	●	●	●

The low priority afforded to training and team building skills, contrasted with the importance assigned to inspection preparation responsibilities, highlights the priorities of the surface warfare community prior to the advent of TQL. Of particular note, none of the officers cited any technical

skills as being particularly important to their jobs. The OSI Survey asked five specific questions relating to processing information or data, analyzing and synthesizing information, using equipment and devices, and using procedures, techniques or processes, and none of these questions were noted as more important than the skills already identified. Based on the matrix the elements of success, defined as areas with agreement in three out of four experience levels, the most important leadership skills, managerial and professional responsibilities are:

- Supervising and directing
- Communications (oral and written)
- Sense of responsibility
- Interacting and coordinating
- Planning and scheduling

E. COMBINING THE ELEMENTS

The ten common KSAs identified in the TQ managers comparison matrix, Table 7, when used as broad areas of competency, capture all of the Navy TQL KSAs that a surface warfare office is expected to master during their career (Section 5.B. and Appendix D). The results of this categorization are displayed in Appendix E.

Even from a cursory glance at Appendix E, it is readily apparent that the Navy TQL education and training focuses

almost exclusively on developing the technical tools to make an officer competent in process planning and improvement. For example, process planning and improvement has forty-seven specific KSAs, compared to communications which has none. The TQL training effort makes little attempt to develop KSAs in less quantifiable areas, for example, communication, influence skills, or positive and forward thinking.

The TQ manager comparison matrix, Table 7, highlights the importance of these less quantifiable abilities. A TQ manager must be technically competent, but also able to draw on other KSAs in order to achieve success. These other KSAs are similar to the results of the OSI survey comparison matrix results, identified in Section 5.D., Tables 8-12. Though not specifically identified, certainly communication, supervising and directing, interacting and coordinating, and planning and scheduling are subsets of the TQ manager KSAs of empowering others, organizational awareness, positive and forward thinking, and facilitating teams. The interpersonal KSAs that provided success to the TQ managers are very similar to those used by surface warfare officers managing in a traditional environment.

Tables 1 and 2 show that most of the KSAs identified in Appendix E need to be taught prior to the Division Officer tour. This means that USNA/NROTC/OCS, SWOS Division Officer course, and Division Officer NAVLEAD are excellent candidates

to absorb education and training for these KSAs. As noted earlier, although Naval Academy graduates receive considerable TQL training, NROTC and OCS graduates are only taught a very brief introduction.

The current method of conducting 120 hours of TQL education and training on the ship is impractical for the Division Officer. The demands on them to qualify as surface warfare officers, to learn how to effectively manage their division and its equipment, and to complete watchstanding obligations, will preclude them from attending classroom training to the extent identified in this research.

The current Navy TQL training and education effort, conducted via the TQL training sites in Coronado and Little Creek, risks neglecting interpersonal KSAs while overemphasizing the technical aspects of TQL. Although the course, Team Skills and Concepts, may address some of these areas, it was not considered because it was not identified as a requirement for PAT, QMB, and ESC members. Although not documented, it is possible the Navy TQL education and training program is relying on NAVLEAD and SWOS to develop these KSAs. It is as if the Navy is training people to brilliantly operate a super capable, high speed, TQL computer, but when asked to explain how process improvement is to be implemented, the operator is unable to communicate and share the knowledge gained from the computer.

VI. CONCLUSIONS AND RECOMMENDATIONS

A. CONCLUSIONS

Based on the research the following conclusions are apparent:

- Surface warfare officers require the TQL education and training necessary to learn all of the KSAs identified in Appendix E.
- The Navy TQL courses emphasize the technical aspects of TQL. While technical competency is essential, many of the interpersonal skills that have been hallmarks of traditional Navy leadership, and mainstays of civilian quality managers, will greatly aid the surface warfare officer acting as a quality manager.
- It will be difficult for the surface warfare community to successfully implemen based on the current training provided to surface warfare officers. The roles they must fulfill as quality leaders in the TQ Team organization are crucial to the successful transformation, but they require a significant commitment of time and money for training that is not currently being made. The amount of time required, in excess of 120 hours of classroom instruction, is not compatible with the demands of operational commitments at sea.

- The SWOS Division Officer Course, Division Officer NAVLEAD, and USNA/ROTC/OCS provide the best opportunity to conduct this TQL education and training because all Division Officers will receive the same training in skills vital to managing a division in a TQ environment. They will also immediately be proceeding to the fleet for at least thirty months and will have ample opportunity to apply and reinforce their TQL skills.
- The SWOS PCO, PXO, and Department Head courses provide an excellent opportunity to refresh and update TQL skills, as well as to provide advanced methods and techniques prior to returning to the fleet.

B. RECOMMENDATIONS

Based on the conclusions developed in the previous section, this study recommends the following:

- The surface warfare community integrate Total Quality training into all aspects of the Surface Warfare Officer School Command curricula. SWOS, as the most highly respected surface warfare community school, is the institution that will legitimize and establish a TQ "critical mass" in the surface warfare community.
- Surface warfare officers should receive common fundamental TQL training through USNA, NROTC, and OCS. Initial technical training at SWOS and Division Officer NAVLEAD should include all of the TQL skills these officers will require for their initial fleet tours.

- Utilize Naval War College, Naval Postgraduate School, PCO, PXO, and Department Head School to provide the opportunities for advanced TQL training, including strategic planning, and benchmarking.

C. AREAS FOR FUTURE RESEARCH

- Determine assignment of the TQL KSAs identified by this study to the appropriate training program: USNA/NROTC/OCS, SWOS Division Officer Course, and Division Officer Navlead.
- Further examine for integrating TQL education and training through the surface warfare officer career progression, particularly the roles of the Naval War College, Naval Postgraduate School, and staff colleges.
- More fully explore integration of TQL and NAVLEAD curriculums

APPENDIX A

The sixteen LMET core competencies are listed below:

1. Sets Goals and Performance Standards. Outstanding Navy leaders set goals to improve tasks performance and use them to assess the ongoing performance of a task, as well as the task's results.

2. Takes Initiative. When a problem is encountered, outstanding Navy leaders take initiative in defining it, accept the responsibility of acting on it, and move immediately to solve it.

3. Plans and Organizes. Outstanding Navy leaders plan and organize tasks, people and resources in their order of importance and schedule the tasks for achievement of their goal.

4. Optimizes Use of Resources. Outstanding Navy leaders match individuals' capabilities with job requirements to maximize tasks accomplishment.

5. Delegates. Outstanding Navy leaders use the chain of command to assign tasks by methods other than a direct order, to get subordinates to accept task responsibility.

6. Monitors Results. Outstanding Navy leaders systematically check progress on tasks accomplishment.

7. Rewards. Outstanding Navy leaders recognize and reward for effective performance on a specific task.

8. Disciplines. In holding subordinates accountable for work goals and Navy standards, outstanding Navy leaders appropriately discipline subordinates', in order to increase the likelihood of the subordinates' improved performance.

9. Self-control. Outstanding Navy leaders hold back an impulse and instead weigh the facts, keep a balanced perspective, and act appropriately.

10. Influences. Outstanding Navy leaders persuade people skillfully, up, across, and down the chain of command to accomplish tasks and maintain the organization.

11. Team Builds. Outstanding Navy leaders promote team-work within their work group and with other work groups.

12. Develops Subordinates. Outstanding Navy leaders spend time working with their subordinates, coaching them toward improved performance and helping them to be skillful and

responsible in getting the job done at a high standard.

13. Positive Expectations. Outstanding Navy leaders trust in people's basic worth and ability to perform. They approach subordinates with a desire for the subordinates' development.

14. Realistic Expectations. Although outstanding Navy leaders believe that most subordinates want to and can do a good job, they take care not to set a subordinate up for failure by expecting too much. Concern about a subordinate's shortcomings is expressed honestly.

15. Understands. Outstanding Navy leaders identify subordinates' problems and help them to understand these problems. Such leaders appropriately aid others in solving their problems.

16. Conceptualization. Outstanding Navy leaders dig out the relevant facts in a complex situation and organize those facts to gain a clear understanding of the situation before acting.

[Ref. 9:p. 41]

APPENDIX B

The Fourteen Points for Management

The fourteen points apply anywhere, to small organizations as well as to large ones, to the service industry as well as to manufacturing.

1. Create constancy of purpose toward improvement of product and service, with the aim to become competitive and to stay in business, and to provide jobs.
2. Adopt the new philosophy. We are in aa new economic age. Western management must awaken to the challenge, must learn their responsibilities and take on leadership for change.
3. Cease dependence on inspection to achieve quality. Eliminate the need for inspection on a mass basis by building quality into the product in the first place.
4. End the practice of awarding business on the basis of price tag. Instead, minimize total cost. Move toward a single supplier for any one item, on a long-term relationship of loyalty and trust.
5. Improve constantly and forever the system of production and service, to improve quality and productivity, and thus constantly decrease costs.
6. Institute training on the job.
7. Institute leadership. The aim of supervision should be to help people and machines and gadgets to do a better job. Supervision of management is in need of overhaul, as well as supervision of production workers.

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

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

10. Eliminate slogans, exhortations, and targets for the worked force asking for zero defects and new levels of productivity belong to the system and thus lie beyond the power of the work force.

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

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

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

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

14. Put everybody in the company to work to accomplish the transformation. The transformation is everybody's job. [Ref. 1]

APPENDIX C

The topics provided below amplify the subjects listed in the Air Force TQM Matrix in Chapter IV.

SUBJECTS	*TOPICS*
QUALITY PRINCIPLES	What & Why of Quality: Evolution, Customer Focus, Prevention vs Detection, Process/System Models, Customer/Supplier, Disciplined Methodology, Incremental Improvement, Roles and Responsibilities, Continuous Improvement, Empowerment, Cost of Quality Case Study and Simulation
QUALITY AIR FORCE	What and Why of QAF: Definition, Vision, Mission, Strategic Quality Policy, Goals and Objectives, Purpose of Metrics, AF Quality Council, AF Quality Center, Air Force and MAJCOM Initiatives, Success Stories, Air Force Criteria
CUSTOMER FOCUS	Customer/Supplier/Process Relationship, Identifying Customers/Needs/Requirements, Meeting/Exceeding Customer Requirements, Quality Function Deployment, Departmental Task Analysis
PROCESS MANAGEMENT	System Analysis, Process Identification, Process Improvement Methodology, Problem Solving, Storyboarding, Benchmarking
BASIC TOOLS	Flow Chart, Check Sheet, Run Chart, Control Chart, Cause and Effect Diagram, Pareto Analysis, Histogram, Scatter Diagram, Force Field Analysis, Brainstorming
MANAGEMENT TOOLS	Affinity Diagram, Interrelationship Diagraph, Tree Diagram, Prioritization Matrices, Matrix Diagram, Process Decision Program Chart (PDPC), Activity Network Diagram
METRICS/MEASUREMENT	Purpose, Identifying Appropriate Measures, Selecting Appropriate Tools, Impact of Variation, Relationship to Rewards, Tampering, Special and Common Cause
STATISTICS	Distribution, Variation, Sampling, SPC
TEAM DYNAMICS	Group Dynamics, Group Problem Solving, Team Development, Team Roles and Responsibilities, Conducting Effective Meetings, Conflict Resolution, Developing Self-Managed Work Teams, Meeting Guidelines
INTERPERSONAL SKILLS	Interpersonal Communication, Effective Listening, Giving/Receiving Feedback, Networking, Understanding Self and Others, Values, Coaching, Dealing with Difficult People
QUALITY LEADERSHIP	Values, Ethics, Trust, Teamwork, Commitment, Mentoring, Enabling, Empowering, Creativity, Recognition & Rewards, Change Dynamics, Communications, Leader Roles, Quality Councils, Long-Range Focus
STRATEGIC PLANNING	Strategic Planning, Hoshin Planning, Policy Formulation and Deployment, Individual Goal Setting/Planning, Resource Allocation, System Perspective

The topics provided below amplify the subjects listed in the Air Force TQM Matrix in Chapter IV.

ASSESSMENT	Quality Air Force Criteria, ISO 9000, Self-Assessment Tools and Techniques, Baseline, Quality Audits, Data Gathering, Data Analysis, Management Feedback, Action Planning
SPECIAL TOOLS/TECH.	Taguchi Method, Concurrent Engineering, Reliability Engineering, Design of Experiments, Theory of Constraints

APPENDIX D

TQ Team Organization Knowledge, Skills, and Abilities.

An ESC, QMB, and PAT team member should recognize:

- The "chain reaction" for quality improvement
- Definition and meaning of TQL
- Customer defines quality of a product or service
- Four parts of System of Profound Knowledge
- An organization is a system
- Need to focus on critical processes
- Quality is achieved through process improvement
- Need for team structure
- Meaning of "Critical Mass"
- Meaning of variation
- Difference between special and common causes
- Significance of the quality loss function
- Who has responsibility for taking action on variation
- Meaning of psychology in System of Profound Knowledge
- Diffused between traditional and TQ approaches to planning and decision making
- Planning and decision making require prediction
- Plan-Do-Check-Act (PDCA) cycle
- How PDCA provides method for continuous improvement
- Purpose and variety of tools used in TQL

- Where tools may be used in PDCA cycle
- Difference between control limits and specifications
- Deming's fourteen obligations of management, The Fourteen Points
- Fourteen Points are a prescription for TQL

An ESC and QMB member should be able to:

- Define process management
- State importance of process management
- Identify role of process management in TQL
- Clarify their ESC/QMB primary responsibilities and the major products and services provided to meet those responsibilities
- Identify customers and their needs
- Align customer need with responsibilities of ESC/QMB
- Develop a prioritized list of major products and services
- Use a tree diagram to identify products and services provided to meet ESC/QMB responsibilities
- List methods to identify customer needs
- Use data form customer needs forms and affinity diagram to group and prioritize customer needs
- Use a weighted matrix diagram to align customer needs with primary organization responsibilities that the ESC/QMB provides to achieve its purpose
- List all work processes needed to perform the

prioritized major product and or service identified in step two by constructing a 50,000 foot view flow chart

- Use the combination interrelationship digraph (I.D.) matrix method to identify relationships and the strength of relationships and the strength of relationships between processes
- Define critical processes using a deployment flow chart
- Understand the importance of refining the process by analyzing and eliminating non-value added work
- Identify customers key quality characteristics
- Identify and select process measures (both in process and outcome)
- Determine the appropriate measurement tool
- Understand the importance of standardization and ways to achieve it
- Measure process results
- Analyze process measurement data
- Identify processes that need improvement
- Identify and verify root causes of problems
- Select root causes
- Make improvements to the process by eliminating root causes
- Standardize the process
- Understand the importance of using a process improvement methodology

- Given the PDPC tool and the results of planning, using the other seven management and planning tools, participants will be able to define the characteristics of a planning process
- Identify barriers and obstacles
- Develop contingency actions for barriers and obstacles

A QMB member should have the ability to:

- Recognize the relationship between the PDCA cycle and the use of data
- Develop a data collection plan within the framework of the PDCA cycle
- Explain the sequence of activities to achieve process improvement
- Describe and apply procedures to identify and prioritize stakeholders
- Describe and apply procedures to identify and prioritize specific stakeholder needs and wants
- Develop operational definitions for quality characteristics

- Identify procedures for translating stakeholder requirements into quality characteristics the organization can produce
- Identify factors contributing to a particular quality characteristic using cause and effect diagrams
- Identify procedures for understanding the processes that contribute to stakeholder requirements using deployment and opportunity flow charts
- Identify characteristics of data sets
- Identify sources of variation
- Distinguish between process stability and process capability
- Assess and achieve stability using run charts
- Assess process stability using a control chart
- Construct variables control charts
- Collect and organize data for use in control chart
- Diagnose a process to differentiate between common and special causes
- Actions required are based on common or special causes
- Construct and stakeholder attribute charts
- Assess the effectiveness of changes using attribute charts
- Identify appropriate applications of attribute charts throughout the extended system
- Recognize the advantages and limitations of attribute

charts

- Assess process capability
- Use histograms to depict process capability
- Determine the system changes that will bring further improvement
- Identify requirements for suppliers
- Establishing procedures for communicating requirements to suppliers
- Explain the importance of achieving stability and capability of input quality characteristics
- Explain the importance of asking suppliers to improve their own extended system

[Refs. 28, 45, 46]

APPENDIX E

The ten common KSAs identified in the TQ managers comparison matrix, Table 6, when used as broad areas of competency, capture all of the Navy TQL KSAs that a surface warfare officer is expected to master during their career. The results of this categorization are displayed here.

The common TQ KSAs identified from Table 6 serve as headings with specific Navy TQL KSAs following in bullet format.

Process Planning and Improvement

- Need to focus on critical processes
- Quality is achieved through process improvement
- Meaning of variation
- Difference between special and common causes
- Significance of the quality loss function
- Who has responsibility for taking action on variation
- Difference between control limits and specifications
- Plan-Do-Check-Act Cycle
- Purpose and variety of tools used in TQL
- Where tools may be used in PDCA cycle
- Define process management
- State importance of process management
- Identify role of process management in TQL

- Align customer need with responsibilities of ESC/QMB
- Use a tree diagram to identify products and services provided to meet ESC/QMB responsibilities
- List all work processes needed to perform the prioritized major product and or service identified in step two by constructing a 50,000 foot view flow chart
- Use the combination interrelationship digraph (I.D.) matrix method to identify relationships and the strength of relationships between processes
- Define critical processes using a deployment flow chart
- Understand the importance of refining the process by analyzing and eliminating non-value added work
- Identify and select process measures (both in process and outcome)
- Determine the appropriate measurement tool
- Understand the importance of standardization and ways to achieve it
- Measure process results
- Analyze process measurement data
- Identify processes that need improvement
- Identify and verify root causes of problems
- Select root causes
- Make improvements to the process by eliminating root causes
- Standardize the process

- Understand the importance of using a process improvement methodology
- Define the characteristics of a planning process
- Identify procedures for understanding the processes that contribute to stakeholder requirements using deployment and opportunity flow charts
- Identify characteristics of data sets
- Identify sources of variation
- Distinguish between process stability and process capability
- Assess and achieve stability using run charts
- Assess process stability using a control chart
- Construct variables control charts
- Collect and organize data for use in control chart
- Diagnose a process to differentiate between common and special causes
- Actions required are based on common or special causes
- Construct and interpret attribute charts
- Assess the effectiveness of changes using attribute charts
- Identify appropriate applications of attribute charts throughout the extended system
- Recognize the advantages and limitations of attribute charts
- Assess process capability
- Use histograms to depict process capability

Promoting Quality

- The "chain reaction" for quality improvement
- How PDCA promotes constant quality improvement
- Identify procedures for translating stakeholder requirements into quality characteristics the organization can produce
- Identify factors contributing to a particular quality characteristic using cause and effect diagram
- Identify requirements for suppliers
- Establishing procedures for communicating requirements to suppliers
- Explain the importance of achieving stability and capability of input quality characteristics
- Explain the importance of asking suppliers to improve their own extended system

Facilitating Teams

- Need for team structure
- Meaning of psychology in System of Profound Knowledge
- Clarify ESC/QMB primary responsibilities and major products and services provided to meet responsibilities
- Align customer need with responsibilities of ESC/QMB
- Use a tree diagram to identify products and services provided to meet ESC/QMB responsibilities
- Recognize the relationship between the PDCA cycle and the use of data

- Develop a data collection plan within the PDCA cycle
- Explain the sequence of activities to achieve process improvement

Satisfying Customers

- Customer defines quality of product or service
- Identify customers and their needs
- Develop prioritized list of major products and services
- List methods to identify customer needs
- Use data from customer needs forms and affinity diagrams to group and prioritize customer needs
- Use a weighted matrix diagram to align customer needs with primary organizational responsibilities that the ESC/QMB provides to achieve its purpose
- Identify customer key quality characteristics

Organizational Awareness

- An organization is a system
- Identify barriers and obstacles
- Describe and apply procedures to identify stakeholders
- Identify stakeholders needs and wants

Empowering Others

- The fourteen obligations of management, Demings' Fourteen Points
- Fourteen Points prescription for TQL

Inspiring Change/Building Vision

- Definition and meaning of TQL

Positive and Forward Thinking

- Planning and decision making requiring prediction

Influence Skills

NONE

Communicating

NONE

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