Hollow Promises

The Problem of Culture and the Integration of new Technology into the Navy

A Monograph
by
Lieutenant Commander Bryan P. Ponce
United States Navy

School of Advanced Military Studies
United States Army Command and General Staff College
Fort Leavenworth, Kansas
AY 03-04

SCHOOL OF ADVANCED MILITARY STUDIES

MONOGRAPH APPROVAL

Lieutenant Commander Bryan P. Ponce, USN

Title of Monograph: Hollow Promises: The Problem of Culture and the Integration of New Technology into the Navy.

Approved by:

_____	Monograph Director
CDR John T. Kuehn, MMAS	
_____	Professor and Director Academic Affairs, School of Advanced Military Studies
COL Kevin C. M. Benson, MMAS	
_____	Director, Graduate Degree Program
Robert F. Baumann, Ph.D.	

Report Documentation Page

Form Approved
OMB No. 0704-0188

1. REPORT DATE	2. REPORT TYPE	3. DATES COVERED
26 MAY 2004		**-**

4. TITLE AND SUBTITLE	5a. CONTRACT NUMBER
Hollow promises: The problem of culture and the iIntegration of new technology into the Navy	5b. GRANT NUMBER
	5c. PROGRAM ELEMENT NUMBER
6. AUTHOR(S)	5d. PROJECT NUMBER
Bryan Ponce	5e. TASK NUMBER
	5f. WORK UNIT NUMBER
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)	8. PERFORMING ORGANIZATION REPORT NUMBER
US Army School for Advanced Military Studies,250 Gibbon Ave,Fort Leavenworth,KS,66027	**ATZL-SWV**
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)	10. SPONSOR/MONITOR'S ACRONYM(S)
	11. SPONSOR/MONITOR'S REPORT NUMBER(S)

12. DISTRIBUTION/AVAILABILITY STATEMENT

Approved for public release; distribution unlimited

13. SUPPLEMENTARY NOTES

14. ABSTRACT

Current Navy transformation is largely characterized by technology associated with Network Centric Warfare or NCW. New technologies and systems, however, often fail to live up to promised potential due to organizational resistance. The research problem of this monograph is to consider if current Navy culture (specifically the sub-culture of the Surface Warfare community) is compatible with NCW technologies and concepts. The research method for this monograph consists of using an historical case study as a point of reference and then draws parallels to contemporary Navy transformation. The historical case study used is the installation of radar onboard surface combatants in the Pacific at the beginning of the Second World War. The monograph demonstrates that the actions of U.S. Navy surface commanders during early engagement with Japanese Naval forces were consistent with existing culture despite the fact that such actions were counterproductive to the effective employment of radar. As a result, Navy surface forces suffered significant defeats, despite having a decisive technological advantage over the Japanese forces. Regarding contemporary Navy transformation, elements of Navy culture were identified that will potentially hinder the effective integration of Network Centric Warfare systems and concepts.

15. SUBJECT TERMS

16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON
a. REPORT	b. ABSTRACT	c. THIS PAGE			
unclassified	**unclassified**	**unclassified**	**1**	**75**	

Abstract

HOLLOW PROMISES: THE PROBLEM OF CULTURE AND THE INTEGRATION OF NEW TECHNOLOGY INTO THE NAVY. By Lieutenant Commander Bryan P. Ponce, USN, 76 pages.

A major aspect of current naval transformation is the integration of new technology. Current Navy transformation is largely characterized by technology associated with Network Centric Warfare or NCW. New technologies and systems, however, often fail to live up to promised potential due to organizational resistance. In order for Network Centric Warfare to meet promised potential, leaders must depart from current cultural values. The research problem of this monograph is to consider if current Navy culture (specifically the sub-culture of the Surface Warfare community) is compatible with NCW technologies and concepts.

The research method for this monograph will consist of using an historical case study as a point of reference and then to draw parallels to contemporary Navy transformation. An anthropological model of culture was used to define critical elements of both the historical and contemporary Navy surface culture. The historical case study used was the installation of radar onboard surface combatants in the Pacific at the beginning of the Second World War.

The monograph demonstrates that the actions of U.S. Navy surface commanders during early engagement with Japanese Naval forces were consistent with existing culture despite the fact that such actions were counterproductive to the effective employment of radar. As a result, Navy surface forces suffered significant defeats, despite having a decisive technological advantage over the Japanese forces. Regarding contemporary Navy transformation, elements of Navy culture were identified that will potentially hinder the effective integration of Network Centric Warfare systems and concepts.

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CHAPTER ONE

INTRODUCTION

The United States military is undergoing a process of transformation. Transformation, in the military or otherwise, is often characterized by the integration of new technology and systems. The process of organizations adapting to and effectively using new technology is frequently, however, a difficult and lengthy process. Many times this integration process is hampered by a lack of "buy-in," or a belief in the efficacy a technology, system or concept, from any or all levels of an organization. This lack of faith may be due to the technology itself or the implications of that technology, as when individuals resist technology primarily for philosophical reasons.

Military examples of institutional resistance to technology include: U.S. Army resistance to repeating rifles out of a fear that they would lead to the wasting of ammunition, U.S. Navy resistance to steam propulsion out of fear of the social changes it would bring, or Japanese Naval resistance to investing in radar early research because it lacked an "immediate practical use." [1]

There are also more concrete or technical reasons why emerging technologies meet with resistance in organizations, despite buy-in regarding the utility of the technology. One of these technical reasons is substandard performance, which is often the result of immaturity in a technology or system. If a system is rushed into production too early, its performance may not provide a marked improvement over the current methods employed

[1] William McBride, *Technological Change and the United States Navy 1865-1945* (Boston: the John Hopkins University Press, 2000), 17; David C. Evans and Mark R. Peattie, *Kaigun: Strategy; Tactics and Technology in the Imperial Japanese Navy, 1887-1941* (Annapolis: Naval Institute Press, 1997), 415.

and thus taint the faith individuals put in the utility of the system or technology. Design issues in a new system such as excessive complexity or poor ergonomics are further technical reasons new technology can meet with organizational resistance or even failure. Design issues can create an atmosphere where the benefits of a technology are offset by the negative characteristics of the system. Personnel issues such as insufficient manning or training can further prevent the optimal performance of a system or create an unacceptable manpower drain, thus hindering its integration. Organizations are keenly aware of these factors as they seek to integrate new technology. They normally expend much effort in addressing both the philosophical and technical aspects of new technology as they seek buy-in from both operators and leaders when fielding new systems. A contemporary example of a directed effort to overcome philosophical resistance to change was when Chief Staff of the U.S. Army General Shinseki engaged in a public relations campaign to "sell" the Interim Brigade Combat Team (IBCT) or Stryker Brigade to the United States Army. Technical aspects of new technology also receive significant effort as ergonomics, training, logistics support, manning and system performance are all normally addressed during the fielding of new technology.

Philosophical resistance and technical problems associated with new technology are often insufficient to explain why technologies experience difficulty when first introduced. An institution can embrace a new technology openly and see it function as designed, but still see that technology fail to result in significant improvement in capabilities or performance. One reason why technology can fail in such circumstances is that people often behave in such a manner so as to negate the benefits of the technology. More often than not, this behavior cannot be blamed on malice or incompetence, but on culture.

The essence of culture is how a people define themselves and how they behave. Although it is about people, it is larger and more enduring than any individual and often remains obscured to those who exist within it. Cultures develop inertia and resist change, leaving individuals with little ability to alter it. To the anthropologist, culture is synonymous with a society or a group of people who are separated and distinct from their neighbors.[2] The United States Navy can be viewed as a distinct society, particularly in the years leading up to the Second World War.

In the years immediately preceding World War Two, scientists made rapid technological advances in the detection of distant contacts by the means of radio detection and ranging, or radar. Navy leaders quickly realized the military potential of the technology and installed it on warships. During the war, radar was critical in enabling the United States Navy to defeat the naval air and surface forces of Japan. The integration of radar, however, encountered significant difficulties as operators and leaders struggled with the employment of this new technology. This struggle is vividly borne out in naval surface actions in the waters around Guadalcanal in 1942. Despite the fact that the U.S. Navy surface combatants possessed radar and Japanese Navy ships almost completely lacked the technology, the U.S. Navy suffered significant losses in night fighting. Within two years, however, the U.S. Navy had adapted and was able to inflict punishing damage to the Japanese Navy in surface actions associated with the battle of Leyte Gulf.

The case study of the United States Navy experience with radar in the Pacific during the Second World War provides an excellent example of how an institutional culture can

[2] Palomar College, *Human Culture: What is Human Culture?*; available from http://anthro.palomar.edu/culture/culture_1.htm; Internet; accessed 28 November 2003.

both embrace a technology and at the same time hamper its effective use and integration. The Navy embraced the new radar technology because it clearly understood radar's potential. Although some individuals did raise objections to radar on the philosophical grounds that it might lead to the erosion of core navigation and gunnery competencies, they did not advocate reverting to a time prior to radar. These individuals simply wanted to proceed with caution and not erode core competencies that defined the surface fleet.

Although radar was a very young technology during World War Two, neither philosophical resistance to the technology nor technical inadequacies are sufficient enough to explain its failure at the beginning of the war to impact the performance of U.S. Navy warships, particularly in night fighting where the technology offered the greatest promise to provide a decisive advantage over the Japanese. Although radar did suffer from poor displays, lack of qualified operators and limited range, it was a quantum leap forward over the previous optical technology. Furthermore, U.S. Navy aircraft carrier and air forces were able to integrate radar early in the war, supporting the fact that any technical difficulties were surmountable.[3] In contrast to their naval aviation counterparts, Navy surface combatants struggled with the new technology and suffered defeat after defeat at the hands of the Japanese in the first year of the war, despite holding an absolute advantage over the Japanese in radar systems.

To answer the question of why one branch of the Navy rapidly and effectively integrated radar technology whereas another struggled, it is necessary to look at the role of culture. In the Navy surface community leaders embraced radar, yet acted so as to

negate may of the tactical advantages afforded by radar. These actions included designating the largest vessels as flagships, maintaining rigid control over subordinate units, utilizing linear formations and closely stationing escort vessels to the main body. These actions were all guided by tradition and culture and not by the technical aspects of radar.

Current military and naval transformation is marked by new technology and systems. One of the cornerstones of Navy transformation is Network Centric Warfare or NCW. Advocates of NCW promise that it will yield unprecedented clarity and permit independent action by subordinates, similar promises made over sixty years ago when radar was first fielded.

Leaders advocating current transformation efforts are working hard to achieve buy-in for this technology. Technicians and administrators are likewise working to ensure that these technologies perform as advertised. Although such efforts are foundational for the effective integration of new technologies and systems, the role of culture must not be overlooked. It is culture that largely determines how people will act and how rocky the path to effective integration of technology will be.

Naval warfare and the next generation of U.S. Navy surface combatant will be very different from what current leaders have experienced. Leaders and designers envision a fully networked fleet that is completely interconnected, provides unfettered access to information to all levels of the chain of command, leverages web based “reach back” assistance for afloat units and consists of ships manned with significantly smaller crews.

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[3] Paul Van Cozens, “The Role of Radar in the Pacific Theater During World War II: Deployment,

All of these goals are within the realm of philosophical and technical possibility. What is less certain is how each of these proposals will play out when they meet Navy culture on the deckplates. It is critical that the impact of culture be considered or the Navy's experience with NCW may mirror that of 1942 when the service embraced new technology in the form of radar, yet failed to appreciate the cultural implications of adopting that new technology. During World War Two it took a cultural crisis precipitated by the Pearl Harbor attack, naval defeats around Savo Island, and the influx of "new blood" to shake sufficiently the foundations of traditional naval culture and cause change. The problem with this cultural crisis was that it was paid for in blood and warships, two resources the Navy of today can ill afford to squander.

Acceptance and Effect" (M.S. Thesis, San Jose State University, 1993), 24-26.

CHAPTER TWO

THE PROBLEM OF CULTURE

> Transformation is first and foremost about changing culture. Culture is about behavior -- about people -- their attitudes, their values and their beliefs. What we believe, what we value, and our attitudes about the future are ultimately reflected in our actions -- in our strategies and processes, and the decisions that emerge from them.[4] VADM Arthur Cebrowski, Director Office of Force Transformation

The relevance of culture to current military transformation is acknowledged at the highest levels of the military. Despite this fact, there is little agreement on what exactly culture is or what it is capable of impacting. The Department of Defense Office of Force transformation held a workshop on 21-22 October 2003 entitled "Introducing Innovation and Risk: Implications of Transforming the Culture of the Department of Defense." One of the tenants of the workshop was that current military culture is rooted in the Industrial Age and needs to change to meet the challenges of the Information Age. The two primary aims of the workshop were to "1) Determine optimum cultural traits for an Information Age Department of Defense, and 2) specify the means most conducive and effective in achieving those desired outcomes."[5] This perspective of culture and transformation is one that bears the mark of contemporary business theory and practice.

In business theory there are numerous definitions of the term culture, but the following put forth by Edgar Schein[6] is widely recognized and used: "a pattern of shared assumptions that the group learned as it solved its problems of external adaptation and internal integration, that has worked well enough to be considered valid and, therefore, to be taught to new members as the correct way to perceive, think, and feel in relation to those problems."[7] Despite the frequent usage

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[4] Congress, Senate. Senate Armed Services Committee, Emerging Threats and Capabilities Subcommittee: Hearings before the Senate Armed Services Committee, Emerging Threats and Capabilities Subcommittee, 108th Cong., 1st Sess., 14 March 2003.

[5] Office of Force Transformation, *Transforming Military Culture*; available from http://www.oft.osd.mil/initiatives/tmc/index.cfm; Internet; accessed 03 December 2003.

[6] Chairman of the Organization Studies Group of the MIT Sloan School from 1972-1982, Sloan Fellows Professor of Management1978-1990, biography available at http://web.mit.edu/scheine/www/bio.html.

[7] John Middleton, *Culture* [book on-line] (Oxford, United Kingdom. Capstone Publishing, 2002, accessed 03 December 2003); available from http://www.netlibrary.com/ebook_info.asp?product_id=67141; Internet, 10.

of the concept of an "organizational culture" in the contemporary business community, the concept is a new one, only dating back to the early 1980s.[8] This business concept of culture maintains that the creation of a culture is inevitable and occurs quickly. Business consultant Russ Giles asserts that "[i]f you work in a company with more than four employees that's been in business for more than two months, you have an organizational or company culture. It seems that human beings cannot hang together for very long without come repetitive interaction beliefs and work strategies showing up."[9] A bedrock assumption of the business community is that culture is capable of being changed, although existing culture will normally resist such external efforts to impose change. If such change were not possible, or only possible over decades and at great effort, management and business consultants and theoreticians would have a hard time convincing businesses to employ them or their ideas. Lastly the business concept of culture is one that is restricted to interactions in the workplace. In Schein's definition, he is discussing behavior that is driven by the work related problems of "external adaptation and internal integration." What is notably absent in this view is the view of the people or the organization within a broader worldview. In short, the business concept of culture is narrow, primarily focused on how individuals think and act at a given location during a specific timeframe (i.e. the workday).

The business theoretical construct of culture has applicability when considering how individuals within a specific command interact or in conceptualizing how to foster an atmosphere in which transformation can more effectively occur. Due to its limited scope, however, it is insufficient for fully analyzing culture within the military context and considering specifically how the military reacts to rapid changes, such as the fielding of new technology or systems. The model of culture used by anthropologists is more appropriate for analyzing military behavior and specifically for assessing how the military reacts to new technology.

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[8] Ibid., 14.
[9] Russ Giles, "Identifying and Influencing Organizational Culture," Allies Consulting; available from http://www.alliesconsulting.com/resources/articles/indinflcult.html; Internet; accessed 04 December 2003.

To the anthropologist, culture is "the full range of learned human behavior."[10] The early English anthropologist Edward B. Tylor proffered a more concise definition in 1871, characterizing culture as "that complex whole which includes knowledge, belief, art, law, morals, custom, and any other capabilities and habits acquired by man as a member of society."[11] For the anthropologist, the concept of culture is larger and more amorphous than business definitions because it encompasses the totality of a society. Culture is strong and enduring, with the individual having little or no ability to control it or its course.[12] Due to this magnitude and pervasiveness, individuals are often blind to the very existence of culture.[13] These significant differences in how the business and anthropological communities view culture can be primarily traced back to the totality with which each views culture as impacting the lives, thoughts and actions of people within their system.

The concept of culture as used by anthropologists generally relates to societies as a whole, such as the French in Europe or the Igbo in Africa. This fact could lead some to assert that the distinction of a culture in the United States Navy apart from American Society is a false one. Anthropologists do, however, recognize the existence of sub-cultures within a larger complex culture, which are set apart and distinct from the larger society and culture as a whole. Thus whether it is called culture, or sub-culture, the concept of an organization being set apart from the broader society is appropriate.

Despite these significant differences between how the business and anthropological communities view the concept of culture, there are many similarities in their views. Both outlooks view culture as something that develops inertia of its own and as such resists change. The result of this resistance or push back is that change is often only forthcoming after a significant event

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[10] Palomar College, *Human Culture: What is Human Culture?*; available from http://anthro.palomar.edu/culture/culture_1.htm; Internet; accessed 28 November 2003.
[11] Ibid.
[12] Leslie A. White, *The Concept of Cultural Systems: A Key to Understanding Tribes and Nations* (New York: Columbia University Press, 1975), 8.

such as a business's naming a new CEO or a society's sustaining a "cultural crisis." Both outlooks hold that culture determines the behavior of individuals within the system and that individuals are often blind to its existence, particularly when they have been immersed in it for a long time. Furthermore, both concepts view external entities such as artifacts, behavior and structures as reflecting culture, although they are not culture in and of themselves. Despite the existence of these external things, culture is essentially about people and is primarily transmitted by people, although this transfer is largely subconscious and not a deliberate attempt to transfer "culture" as a formal construct. Finally, both views also hold that culture is not static and that it changes over time.

The anthropological construct of culture is one that is more applicable to the military and specifically to the United States Navy because these institutions more closely resemble a distinct society than a business.[14] In the U.S. Navy, culture goes deeper than in any business. The roots of Navy culture go back hundreds and even thousands of years. There is a formal and reinforcing indoctrination process that occurs for every sailor, whether in boot camp, at the Naval Academy, Officer Candidate School or Naval Reserve Officer Training Corps. This indoctrination process is formalized, as opposed to the business community where it is normally informal. Even when the indoctrination process is formal in businesses, it rarely approaches the totality of that of the Navy. Furthermore, indoctrination within the U.S. Navy is continually reinforced through customs, traditions and the formality of the institution.

Another factor that separates the culture as found in the Navy apart from a majority of businesses is the degree to which the naval personnel are isolated from society at large. The separation is readily apparent in the current force as ships deploy away from homeport for six months and longer. This isolation was even more pronounced in the 1930s when the battle fleet

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[13] Palomar College, *Human Culture: Characteristics of Culture*; available from http://anthro.palomar.edu/culture/culture_2.htm; Internet; accessed 28 November 2003.

[14] This is true of jobs in the context of modern Western society, as opposed to other societies or times where hereditary, class, geography or religion often determined ones job, and visa versa

was forward deployed to Hawaii and where the families of naval officers formed into tighter communities at their respective bases. The naval profession, and military professions in general, are careers that place great demands on their members in peace and even higher ones in wartime. All service members pledge an oath to serve and understand that this oath may require them to lay down their lives. With the exception of public service jobs, a majority of civilian jobs do not demand such devotion, thus making the Navy unique in contrast to most businesses.

The last factor that sets the Navy apart from any business endeavor or from society at large is the uniqueness of its mission and technology. They are the only organization that was and is entrusted with the defending the interests of the nation on the high seas. They are the sole users of many specific pieces of technology within the United States society as a whole. Numerous businesses may have the same mission and even use the same equipment to carry out their mission, but no other organization within the United States besides the Navy employs specialized technology such as aircraft carriers or warships.

In this monograph, I will use an anthropological construct of culture due to its holistic nature and because the United States Navy more closely resembles a distinct society rather than a business. The construct I will define the concept of culture is one set forth by Leslie White in 1975. White proposes that a cultural system consists of three significant components: technology, sociology and ideology. Technology consists of the tools and weapons and the techniques to use them. Sociology consists of the customs, institutions and codes of a group. Ideology consists of the ideas (concepts) and beliefs of a group.[15] I will describe the characteristics of the United States Navy in the years leading up to World War Two and today that distinguish it from American society as a whole.

In order to fully understand the conduct of the United States Navy during World War Two and how effectively it greeted the advent of new technology, it is critical to understand the culture its leaders lived and operated in. Entire books have been written on the topic of Navy culture, but

for the purpose of this monograph I will focus my discussion on aspects of Navy culture that are relevant to the case studies I consider. When possible, I shall focus specifically on the culture of the surface Navy in the Pacific for the years leading up to World War Two. Furthermore, I will focus cultural discussions on the officer community, as they were the individuals who planned and directed combat operations.

After the Civil War the U.S. Navy had slipped to a third rate naval power whose antiquated wooden ships and smooth bore cannon resulted in its not even being ranked among notable world navies by European powers.[16] This sorry state of affairs experienced a turning point in 1883 when Congress authorized the construction of the ABCD ships, unique from other American warships at the time in that they had steel hulls. In the nearly sixty years following the authorization of the ABCD ships until the outbreak of the Second World War, the U.S. Navy underwent monumental changes. Steel had replaced wood in hull construction. Steam had replaced sail as a prime mover. Ships were fueled by oil and able to replenish at sea, thus were not tied to overseas coaling stations.[17] Submarines and aircraft moved from the realm of science fiction to combat tested weapon systems. Radio augmented traditional visual communication methods such as flags, semaphore and lights. The Naval Academy ceased to be the sole source of line officers (those eligible to command at sea) with the establishment of the Naval Reserve Officer Training Corps program in 1925.[18] Enlisted recruiting and training patterns changed as foreigners and enlistees largely drawn from seaports were replaced by native-born citizens drawn from across the nation.[19] The service became increasing technical and leaders envisioned using fleets in *guerre*

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[15] White, 17-19.
[16] Kurt Hakemer, "Building the Military-Industrial Relationship: The U.S. Navy and American Business 1854-1883," *Naval War College Review*, Spring 1999 [journal on-line]; available from http://www.nwc.navy.mil/press/Review/1999/spring/art4-sp9.htm; Internet; accessed 22 February 2004.
[17] John B. Lundstrom, *The First South Pacific Campaign: Pacific Fleet Strategy December1941 – June 1942* (Annapolis, MD: Naval Institute Press, 1976), 13.
[18] Robert L. O'Connell, *Sacred Vessels: The Cult of the Battleship and the Rise of the U.S. Navy* (New York: Oxford University Press, 1991), 15.
[19] Frederick S. Harrod, *Manning the New Navy: The Development of a Modern Naval Enlisted Force, 1899-1940* (Westport, CT: Greenwood Press, 1978), 6.

d'escadre (fleet on fleet warfare) vice the historical pattern of *guerre d'course* (commerce raiding).

Yet despite all of these changes, the objective of fleets largely remained unchanged. Specifically, they were designed to seek out enemy forces and put as much ordinance on them as possible. With surface warships and fleets, the two primary methods of delivering ordinance by the outbreak of the Second World War were torpedoes and gunfire. Although equipment, training and tactics had all evolved over the past century, they all relied upon optical targeting until the advent of radar or Radio Detection and Ranging. U.S. Navy interest in radar began in 1922 when the Naval Research Laboratory (NRL) started investigating the potential of using radio waves to create a trip wire type of system to guard against enemy ships entering friendly ports.[20] Research continued during the 1930s and by 1937 a radar set was ready to be tested onboard the USS LEARY (DD 158).[21] In 1939 an updated NRL radar system was installed onboard the USS NEW YORK (BB 35). After successful testing, the NEW YORK radar set was fielded as the XAF and CXAM. Although still primitive the XAF and CXAM radar systems provided defense against night destroyer attacks, were able to spot shell splashes and track large caliber shots.[22] In short, although the radar systems were primitive by current standards, they did represent a quantum leap over previous optical technology and provided commanders with a tool with which to fight at night other than with spotlights, firing at enemy muzzle flashes or relying upon flares for illumination.

Against the backdrop of this United States Navy of the 1930s, it is possible to discern critical and defining cultural characteristics that officers carried into the Second World War. Some of these cultural traits dated back to the earliest seafaring days, whereas others were recent products of a steel navy. The application of the White cultural model (in which culture consists of

[20] Buford Rowland and William B. Boyd, *U.S. Navy Bureau of Ordinance in World War II* (Washington, DC: Bureau of Ordnance, Department of the Navy, 1953), 409.
[21] Ibid., 412.
[22] Ibid., 414.

the three components of technology, sociology and ideology) develops a picture of what that culture looked like. Technologically, Navy culture was rooted in physical mass and using that mass in an offensive manner. Sociologically, Navy culture was hierarchical and insular, relying upon discipline and obedience. Ideologically, it was elitist and valued efficiency and order. Although these characterizations of Navy culture are very reductive, they are appropriate. A fuller exploration of Navy culture is beyond the scope of this monograph and other cultural traits played lesser roles in determining how commanders fought in the Pacific.

White defines technology as "tools and weapons and the techniques of using them."[23] At its core the Navy is about technology.[24] This centrality of technology is due to the fact that it is impossible to go to sea, let alone conduct warfare upon the high seas without significant and specialized technology. One of the primary manifestations of this centrality of technology was the education received by U.S. Naval Officers. Prior to the establishment of the Naval Reserve Officer Training Corps program, all active duty line U.S. naval officers received their commissions from the Untied States Naval Academy and this institution was largely an engineering school.[25] This centrality of and reliance upon technology created an organization where leaders not only trusted technology, but also strongly identified with it.[26] Between 1914 and 1920, Naval officers divided into communities based upon the technology they operated, with the majors groups being surface ships, submarines and aviation.[27] This monograph shall concentrate upon the surface ship community that remained at the heart of what the Navy had historically done and until the Second World War maintained primacy, with the other two groups acting in supporting roles. For the surface community, warship technology had its highest form in

[23] White, 17.
[24] William M. McBride, *Technological Change and the United States Navy, 1865-1945* (Baltimore: The Johns Hopkins University Press, 2000), 4, 8.
[25] O'Connell, 17.
[26] McBride, 8.
[27] Ibid., 112.

the battleship.[28] The surface community, however, was not the only group that accepted the primacy of battleships. Both the aviation and submarine communities accepted roles that supported battleships in fleet actions.[29] Some authors have characterized the faith of individuals (particularly "old school" members of the surface community) who had trusted in the battleship as being part of the "battleship cult" or the "gun club." This faith was not absolute or blind, but based upon physics, shortfalls of other technologies and a balanced approach to fleet design.

Since the battle of Lepanto in 1571, sailors have understood the physics of mass upon naval warfare. At Lepanto massive Venetian galleasses delivered overwhelming fire against smaller, but more numerous, Ottoman warships and were critical in defeating the numerically superior Turks.[30] In the days of sail the rating of a ship was based upon numbers of guns and during the American Revolution, Colonial captains were careful about which British ships they tangled with. In the age of steam and steel, the British Dreadnought (launched in 1906) with her main gun battery of ten 12-inch guns set the standard against which all other ships were measured.[31] The United States Navy adopted this battleship paradigm in 1890.[32] Despite the advent of submarines and airplanes, the battleship remained supreme after the First World War. Although the battleship was rooted in the past, ship design and construction was not static during the interwar period. Battleships had undergone modernization, being updated with systems such as antiaircraft guns, radar and improved optics in order to handle enemy material and tactical advances and there were ongoing debates in the *U.S. Naval Institute Proceedings* regarding the need to update battleships. The battleships of 1941 were technologically far superior to those of

[28] Yates Stirling, *Sea Duty: The Memoirs of a Fighting Admiral* (New York: G P Putnam's Sons, 1939), 302.
[29] McBride, 137, 148.
[30] Victor Davis Hanson, *Carnage and Culture: Landmark Battles in the Rise of Western Power* (New York: Doubleday, 2001), 233-234.
[31] Naval Historical Center Homepage, *Online Library of Selected Images: Ships of the British Navy;* available from http://www.history.navy.mil/photos/sh-fornv/uk/uksh-d/drednt9.htm; Internet; accessed 21 February 2004.
[32] McBride, 5.

twenty years earlier, undoubtedly lending weight to the arguments that the ships had kept up with the times and thus remained relevant.

Technologies capable of challenging the battleship had been around for decades in the form of mines, torpedoes, submarines and aircraft, yet they had failed to render the battleships obsolete, at least in the minds of those in the surface community. Two major reasons why these new weapons had failed to dethrone the battleship were that these competing technologies had significant technical limitations and because tactics had evolved. Mines were limited in that they were primarily restricted to coastal or restricted waters. Torpedoes were limited in terms of range and speed. Submarines had primarily been utilized as commerce raiders and were very limited in their range and speed. They also had the disadvantage of having to surface in order to run diesels or run at any significant speed. Furthermore, many senior leaders believed that existing technology in the form of sonar would always provide the ability to always detect enemy submarines[33]. Aircraft were similarly plagued with range and payload limits. American aircraft carriers were also limited in that they did not have armored flight decks, could not operate in heavy seas and had limited ability to operate at night. Actual aviation limitations were further reinforced in the minds of senior leaders in the 1930s because many relied on outdated technical ceilings promulgated in a 1924 General Board Hearing.[34]

Another reason why the battleship continued to remain at the top of the food chain was that American tactics and fleet composition adapted in order to account for these new technologies. A theme emphasized by Mahan and widely accepted up until World War Two, was the need for a balanced fleet.[35] The idea that battleships could "go it alone" was absurd and the necessity to procure and employ a variety of support vessels from destroyers to aircraft carriers in order to form a balanced fleet was clearly articulated in articles in the U.S. Naval Institute's

[33] S. S. Robinson and Mary L Robinson, *A History of Naval Tactics from 1530 to 1930: The Evolution of Tactical Maxims* (Annapolis, MD: The United States Naval Institute: 1942), 907.
[34] McBride, 196.

Proceedings during the interwar years.[36] In fact, in 1927 the Naval War College had come to the conclusion that "One of the outstanding lessons of the past two years has been that no fleet can enter a hostile zone unless it has, beyond a doubt, superiority in the air."[37] The only real issues that were open to debate was what constituted a "balanced fleet" and which of the characteristics among speed, firepower and armor was most important on a battleship. At least one author did point to the possibility of battleship being rendered obsolete, but the basis for this argument was that an enemy might choose to wage a "guerilla" war vice engaging in a traditional fleet on fleet engagement.[38] As long as the assumption that the purpose of the U.S. Navy was to destroy an enemy navy in a fleet on fleet engagement was adhered to, the concept of a fleet without battleships was unthinkable to all but the most visionary thinkers. The bottom line was that battleships could deal out and take significant punishment, operate day or night and operate in all weather—boasts that no other platform could claim. Although visionaries pointed to the potential of new weapons and platforms, the performance of these systems was as of yet unproven. Senior leaders had come of age on surface combatants (with even aviators completing a minimum of one year on a ship before transferring to aviation) and faith in those ships would not die easily.[39] The words of Rear Admiral (RADM) Yates Stirling in 1939 seem to summarize the mood of may senior leaders when he wrote "that the battleship, although the highest evolution of its species, is still a dependent instrument of war, for when accompanied by insufficient numbers of other types of warships it finds itself seriously compromised. These aids are essential for completeness. With

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[35] James C. Bradford, ed., *Admirals of the New Steel Navy: Makers of The American Naval Tradition, 1880 – 1930* (Annapolis, MD: Naval Institute Press, 1990) 30.
[36] Luke McNamee, RADM, USN, "Types of Ships and Why," *United States Naval Institute Proceedings* 56, no. 332 (October 1930): 907-912.
[37] Logan C. Ramsey, LT, USN, "Aircraft and the Naval Engagement ," *United States Naval Institute Proceedings* 56, no. 330 (August 1930): 679.
[38] U.S. Naval Institute Proceedings, "Professional Notes, Miscellaneous: Future Naval Tactics," *United States Naval Institute Proceedings* 56, no. 326 (April 1930): 352-354.
[39] David S. Ingalls, Assistant Secretary of the Navy for Aeronautics, "Naval Aviation Today and in Prospect," *United States Naval Institute Proceedings* 56, no. 332 (October 1930): 891.

these aids accompanying it, the battleship stands out as the most potent weapon of naval warfare and the most reliable."[40]

Since the battleship reigned supreme the only question remaining was how to employ them. Navy writers in the interwar period emphasized the fact that naval tactics were never static.[41] Despite this fact, there were certain tactical maxims that were generally espoused and viewed as enduring. The fist of these maxims was the need to attack.[42] Mahan had preached the need to seek out an enemy fleet and bring them into a decisive battle in order to achieve naval supremacy. This idea was still adhered to in the years leading up to World War Two as is demonstrated by the U.S. Navy's vision of taking the fight to Japan in war plan Orange. The second tactical maxim was the need to concentrate force at the decisive point.[43] This desire to be able to concentrate force at the decisive point manifested itself in forces keeping tight formations so as to enable themselves to bring the maximum firepower to bear on the enemy. The tactical "Holy Grail" of achieving this overmatch was "crossing the T." This formation was a column of one's own ships being able to bring all guns to bear on the beam against a column of ships present a bow aspect, thus limiting the number of guns they can bring into action.

With a culture that had the battleship at its technological center and that sought to maximize firepower on an enemy, the trinity of speed, armor and firepower reigned supreme.[44] In each of these tangible characteristics, more was better. Speed allowed one to bring about action, or retire if the situation demanded it. Armor enabled a ship to absorb punishment. Firepower enabled a ship to inflict punishment on an enemy. In all of these firepower was most significant because it determined how large a foe a ship could engage.[45] The primacy of firepower has

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[40] Stirling, 302.
[41] Robinson, 924.
[42] Ibid., 895.
[43] Ronald T. Strong, LCDR, USNR, "A Beginner's Outline of Strategy and Tactics," *United States Naval Institute Proceedings* 67, no. 459 (May 1941): 625.
[44] J. V. Chase, RADM, USN, "Fleets: Their Composition and Uses," *United States Naval Institute Proceedings* 56, no 332 (October 1940): 895.
[45] O'Connell, 77.

existed since days of sail when ships were rated based upon the number and size of their guns and has determined where commander placed vessels as they prepared for battle. From the earliest days of the United States Navy, admirals were directed to place their most heavily armed ships at the center of a formation in order to permit massing of firepower and to prevent an enemy from breaking his formation. [46] In this culture, bigger was better, particularly when operating with guns and warships.[47] This technological culture of physical mass, however, would prove to be a liability in the electronic age.

White defines sociology as the "customs, institutions, codes and etc" of a group.[48] Sociologically, Navy culture in the years leading up to the Second World War was hierarchical and insular, relying upon discipline and obedience. Of these, the primary underlying sociological aspects of U. S. Navy culture in the years leading up to the Second World War was that it was extremely hierarchical. At the core of this hierarchical culture was the position of the captain of a ship and the absolute authority vested in him. This absolute power and authority of the captain of a ship has been often likened to that of a sovereign.[49] Two factors contributed to this absolute authority. The first was that a ship at sea had no access to an arbitrator to whom one could appeal. The second was that ultimate responsibility rested squarely on the shoulders of the commanding officer. When at sea, the commands of the ship's captain were law.

This rank consciousness did not, however, end with the position of the commanding officer of a ship. All levels of the chain of command were constantly aware of rank and their relative position within the chain of command.[50] One of the clearest examples of this cognizance

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[46] Thomas Truxton, "A Short Account of the General Duties of Officers of Ships of War: From an Admiral, Down to the Most Inferior Office," The Naval Historical Center Homepage; available from http://www.history.navy.mil/faqs/faq59-2.htm; Internet; accessed 12 January 2004.

[47] William Richard Burcham, "An Examination of Delay in the Evolution of Tactics Following the Introduction of New Products of Technology in the U.S. Navy" (Ph.D. diss., George Washington University, Department of Engineering Management, August 1990), 68.

[48] White, 17.

[49] Peter Karsten, *The Naval Aristocracy: The Golden Age of Annapolis and the Emergence of Modern American Navalism* (New York: The Free Press, 1972), 87.

[50] O'Connell, 18.

with and concern for one's position in the naval hierarchy was the *Naval Register* that listed all naval officers as well as their relative position with respect to other officers. One's relative position not only drove promotion, but impacted daily matters such as berthing arrangements or duties.[51] This preoccupation with rank and promotion clearly manifested as Annapolis graduates resisted reserve officers promotion opportunities, particularly during the lean depression years.[52] The naval pecking order was reinforced by the fact that the capabilities and size of vessels determined the rank of their commanders, with battleships and cruisers being commanded by captains, destroyers by commanders, destroyer escorts by lieutenant commanders and patrol boats by lieutenants. This hierarchical culture was one that drove the behavior of junior and senior alike and created an atmosphere where the judgment of seniors was deferred to not only in professional but personal matters. Such relationships served the U.S. Navy well in the age of sail where disciplined formations were critical to combat, but they would prove to be a liability in the Pacific in World War Two.

This hierarchical culture was not merely a veneer for the sake of tradition or for getting better living quarters on a ship, but it was deeply imbedded in the psyche of the Navy and anchored within the trinity of accountability, obedience and discipline. These three traits ensured that the naval hierarchy was respected and punished those who did not adhere to its standards. Accountability applied to all ranks, but again was most clearly manifested in the position of the commanding officer of a ship. Although the captain could not be everywhere on the ship, the burden of responsibility ultimately fell upon him if something went wrong. This attitude was clearly articulated by RADM Stirling when he wrote in 1939 "the captain when on the bridge of his ship must accept all responsibility and can not transfer any of it to others, at least ethically."[53] Closely tied to accountability was the centrality of blind obedience and discipline. Obedience and strict discipline were holdover from days of sail when the operation of a ship was an

[51] Karsten, 63-64.
[52] Ibid., 362.

endeavor that depended upon rapid and unquestioning obedience and the Spartan living conditions bred harsh discipline. The obsession with obedience and discipline, however, continued into the 20th Century, long after the days of sail.[54] This holdover may have been based upon tradition, but was likely due to the fact that both the sea and combat are unforgiving mistresses.

According to White, ideology consists of the "ideas (concepts) and beliefs" of a group.[55] Ideologically, the United States Navy in the interwar period was elitist and placed value upon efficiency and order. The leadership during the interwar period was elitist in many areas. First among these was that they considered themselves to be "a navy second to none."[56] This attitude was undoubtedly born out of having been on the winning side during World War One and being granted a status on par with Great Britain at the Washington Naval Conference in 1922.[57] This attitude of superiority was not limited to the officer corps, but was viewed as existing among the enlisted ranks. This superiority was articulated in the 1943 Bluejacket's Manual when it stated "All civilians do not have in them the makings of a bluejacket"[58] Reinforcing the elite nature of the Navy was the fact that it remained an all volunteer force until the eve of the entry of the United States into World War Two, when demands of the coming war forced the acceptance of draftees, a step that even the President of United States regretted.[59]

Secondly, Navy leadership exhibited racial elitism.[60] During the 1930s it was not unusual to see references to "old darkey" and RADM Stirling in 1939 wrote of needing to be careful not

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[53] Stirling, 111.
[54] O'Connell, 19.
[55] White, 17.
[56] Donald W. Mitchell, *History of the Modern American Navy: From 1883 through Pearl Harbor* (New York: Alfred A Knopf, 1946), 341.
[57] U.S. History.com, *Washington Naval Conference*: available from http://www.u-s-history.com/pages/h1355.html; Internet; last accessed 22 February 2004.
[58] United States Naval Institute, *The Bluejacket's Manual*, 11th ed., (Annapolis, Md.: United States Naval Institute, 1943), 81.
[59] Robert Greenhalgh Albion, *Makers of Naval Policy 1798-1947*, ed. Rowena Reed (Annapolis, Md: Naval Institute Press, 1980), 519.
[60] Ronald H. Spector, *At War At Sea: Sailors and Combat in the Twentieth Century* (New York: Penguin Books, 2001), 264-265.

to fall in love with "dark skinned" women in Hawaii. [61] [62] [63] Before the American entry into the Second World War, racism tainted their perception of the performance of warring groups. For example, the Americans dismissed potential lessons of an English aerial torpedo attack on Italian warships at Taranto, due to perceived racial inferiority of the Italians to the Anglo-Saxons.[64] The characterization of the Japanese was even more pejorative as the entire race came to be characterized as subhuman and worthy of only being killed.[65] Once the war in the Pacific commenced, it was a race war and racism was an important factor in "powering" the fight.[66] There are numerous examples of American dehumanization of the Japanese such as a sign erected by Admiral Halsey in Tulagi which read "Kill Japs, Kill Japs, Kill the Yellow Bastards, If you do your job you will kill the sons of bitches."[67] Lastly, Navy leaders deemed themselves to be technically and tactically superior to opponents. This attitude was manifested by naval writers boasting of advances made in gunnery since the advent of the Sims method in the beginning of the century and of gunnery competitions as keeping such skills honed.[68] This elitist attitude would have disastrous results in the Pacific theater.

Philosophically, the Navy placed great emphasis upon efficiency and order. This high regard for efficiency and order was likely a result of an emphasis on engineering at the Naval Academy and reliance upon technology that operated along predictable, manageable lines. This high regard for efficiency was so central to the U.S. Navy that Secretary of the Navy Swanson stipulated "To make war efficiently the object of all development and training and to maintain

[61] Lucius C. Dunn, CDR, USN, "What Price Leadership? ," *United States Naval Institute Proceedings* 56, no. 326 (April 1930): 323
[62] E. C. Kalbfus, CAPT, USN, "O'Kay ," *United States Naval Institute Proceedings* 56, no. 329 (July 1930): 602.
[63] Stirling, 17.
[64] McBride, 201-202.
[65] John W. Dower, War Without Mercy: Race and Power in the Pacific War (New York: Pantheon Books, 1986), 78-80.
[66] John A. Lynn, *Battle: A History of Combat and Culture* (Boulder, CO: Westview Press, 2003), 221, 241.
[67] Emory J. Jernigan, *Tin Can Man* (Arlington, VA: Vandamere Press, 1933), 95.
[68] Stirling, 103-107.

that efficiency at all times" as general naval policy in his 1933 *Annual Report*.[69] This preoccupation with order was manifested in shipboard life through a rigid routine, formal assemblies of the crew, constant drill and cleaning.[70] Desire for order was not limited to the running of machinery or a ship, but also impacted how they viewed the nature of war. Naval officers viewed combat as proceeding along ordered lines in which the keys to victory were having the largest and best armed ships.[71] Such an attitude was undoubtedly a carry over from days of sail where victory at sea relied upon keeping an orderly formation and maneuvering in a manner that put you at an advantage over your enemy. This principle was clearly what Thomas Truxton had in mind when he wrote in 1797 "as the forming of a complete, strong, and uniform line is a very material article in naval war, the admiral ought to frequently arrange the squadron under his command into this order, that the inferior officers may observe to bring their ships with great dexterity and alertness, into their several stations, and maintain the regularity of the line when they tack, veer, or sail abreast."[72] This attitude was still alive in the 20th century, with a premium still being placed on ship handling abilities, order being desired and the essential object of combat still being to bring the guns of one's fleet to bear on an enemy formation. Without efficiency and order, it would have been impossible to run the very complex and technical navy. An excessive emphasis on efficiency and order, however, shackled the minds of naval commanders as they fought the Japanese in the Pacific.

In conclusion, U.S. Navy culture in the years leading up to the Second World War was a curious mixture of the ancient and the new. Navy culture placed a premium upon technology. On the eve of the Second World War the epitome of Navy technology was the battleship, which embodied the value of mass, whether it was in firepower, armor or speed. Sociologically, Navy

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[69] Mitchell, 340-341.
[70] O'Connell, 26.
[71] Ibid., 25-26.
[72] Thomas Truxton, "A short Account of the General Duties of Officers of Ships of War: From an Admiral, Down to the Most Inferior Office," The Naval Historical Center Homepage; available from http://www.history.navy.mil/faqs/faq59-2.htm; Internet; accessed 12 January 2004.

culture was hierarchical and insular, relying upon discipline and obedience. Ideologically, it was elitist, valuing efficiency and order. These cultural traits were carried to the war in the Pacific and impacted how commanders fought the Japanese, particularly within the surface community whose leaders grew up on and were most wedded to the paradigm embodied in surface combatants.

CHAPTER THREE

CULTURE AT WORK IN THE PACIFIC

Until the American invasion of Guadalcanal in August of 1942, surface combatants[73] of the United States Navy had not engaged in any significant action against their Imperial Japanese Navy (IJN) counterparts as the earlier battles of Coral Sea and Midway were largely duels between carrier forces. In the waters around Guadalcanal, surface combatants met in battles that closely approximated how traditionalists thought fleet actions would be fought: directly between surface combatants with aviation and submarine forces acting in supporting roles. Additionally, the major surface actions occurred at night, potentially giving the Americans a distinct technological advantage over the Japanese who did not have radar.

Although culture changes, it does so slowly and rapid change is normally only seen in the face of crisis. The invasion of Guadalcanal was only eight months after the outbreak of war, thus it is reasonable to presume that prewar Navy culture was still largely intact. Although the United States Navy's surface fleet had suffered a severe blow at Pearl Harbor, it did not cause pre-war paradigms to be thrown out. The overall strategy of the Navy did not significantly deviate from prewar plans and ship construction priorities still placed the greatest emphasis on battleships.[74] This continuity of prewar culture that placed faith in battleships continued until July 1943 when construction of the MONTANA class battleships was cancelled.[75] Due to its proximity to the outbreak of war and because American surface combatants had not yet fought the Japanese, the surface actions around Guadalcanal present a good case study of how culture norms influenced the behavior of American commanders.

[73] For the purpose of this monograph surface combatants shall be limited to surface vessels designed to directly engage enemy surface or subsurface vessels. Included among these types of vessels are Battleships (BBs), Cruisers (CAs or CLs) Destroyers (DDs), Destroyer Escorts (DEs) and Torpedo Patrol Boats (PTs).
[74] Albion, 527.
[75] McBride, 185.

Many books and articles have been written regarding the naval battles around Guadalcanal and there is a general consensus regarding the reasons for the poor showing of American forces. Included among these explanations are fatigue, Allied use of ad hoc battle groups, turnover of allied commanders, superior Japanese training, tactics and weapons, unwieldy linear formations, tying destroyers to cruisers, over reliance upon radar, poor performance of radar in vicinity of land, poor communication procedures, and poor tactical decisions by commanders. These reasons focus upon the tangible, upon things that can be quantified. Taken by themselves, what these explanations do not address is the less tangible impact of culture upon the commanders and leaders during those surface engagements. Although culture is pervasive, individuals rarely blame it for their behavior, for in doing so they would deny free will and abrogate personal responsibility. Instead, the actions of commanders must be considered and compared to aspects of existing culture in order to determine how that culture could have influenced their behavior. This chapter shall highlight some of significant contributing factors to American shortcomings during surface engagements around Guadalcanal and how Navy culture may have contributed to those shortfalls. Although culture cannot be precisely pointed to as affecting the outcome of these battles, it is a contributing factor to the actions of those involved in the battles. In these surface battles, where force dispositions, command relations and time was critical, the largely ignored hand of culture exerted a subtle yet significant impact.

Although Guadalcanal was invaded by Marines on 07 August 1942, American presence on the island would be challenged for the next six months by Japanese sea, air and land forces. Critical to the Japanese efforts to dislodge the Americans on Guadalcanal was the ability to re-supply their forces ashore by sea and to bombard Marine and Army forces from offshore. It was primarily in response to these sea borne threats that American surface combatants engaged the Japanese.

For the purpose of this monograph I shall restrict my study to battles with the following four criteria. First, the force was under the command of a U.S. Naval Officer and predominately

consisted of American ships. This restriction prevents problems posed by differing cultures in the analysis. The severe American loss at the Battle of Savo will thus be eliminated from direct consideration because the commander was a British Admiral and because there were three Australian ships in the task force. Second, the force consisted of a mixture of surface combatants, the largest of which was at least a cruiser. This requirement ensures that the commanders were not severely restricted by a lack of resources and eliminates minor surface actions. Third, any aircraft used were strictly in a supporting role such as reconnaissance or illumination of enemy ships with flares. Fourth, radar was installed on ships within the force. In all, the case studies are ones in which American leaders were resourced to fight a fleet action as envisioned in pre-war concepts, yet also have to deal with the new technology of radar. Using these criteria result in the battles Cape Esperance (11-12 October 1942), The Naval Battle of Guadalcanal cruiser action (13 November 1942), The Naval Battle of Guadalcanal battleship action (14-15 November 1942) and Tassafaronga (30 November 1942).

The first significant United States Navy surface action in the waters around Guadalcanal was on 09 August when a screening force of Australian and American cruisers and destroyers under the command of Admiral Crutchley RN was severely mauled by a Japanese surface force in a night engagement. The Allies lost four cruisers, over 1000 dead and 700 wounded, with the Japanese emerging virtually unscathed.[76] This loss should have shattered any illusions the Americans might have had regarding the capabilities of the Japanese. The loss was so severe that the Secretary of the Navy ordered Admiral Arthur J. Hepburn, former Commander in Chief of the Fleet to conduct an inquiry.[77] Hepburn listed the following reasons for the loss: the Japanese achieving complete surprise, communications weaknesses, failure to understand enemy intentions, over dependence upon radar, failure to react to Japanese spotter planes, commander

[76] Samuel Eliot Morison, *History of United States Naval Operations in World War II, vol. 2, The Struggle for Guadalcanal August 1942 - February 1943* (n.p., 1948; reprint, Boston: Little Brown and Company, 1984), 34-35, 63.
[77] Ibid., 62-64.

not being with force when Japanese attacked, and a lack of coordinated searches.[78] Despite the severity of the loss, it did not disabuse the U.S. Navy of a "strong feeling of technical and moral superiority over the enemy."[79]

The next major clash of American and Japanese surface forces was at Cape Esperance on 11-12 October 1942 where RADM Scott led a force of four cruisers and five destroyers. The commander was able to drill his force for three weeks prior to the engagement and drew up a careful battle plan. RADM Scott's battle plan called for destroyers to screen ahead of and astern of the main formation, to illuminate targets with their spotlights, to engage large targets with torpedoes and smaller one with guns. The cruisers were to fire when they had the targets and to use their planes to locate the enemy. The forces also knew that radar would be of limited use due to the proximity of land.[80]

The mission of RADM Scott's cruiser force (TF 64) was to protect American convoys by engaging in offensive action. As RADM Scott prepared his ships for battle the evening of the 11th of October he placed the ships in a column with the cruisers SAN FRANCISCO, BOISE, SALT LAKE CITY and HELENA in the center of the formation (in that order), the destroyers FARENHOLT, DUNCAN and LAFFEY in the van (or lead) and destroyers BUCHANAN and MCCALLA in the rear. RADM Scott was embarked in the lead cruiser, the USS SAN FRANCISCO. Of note, SAN FRANCISCO was a heavy cruiser (CA) and had the older SC radar whereas the light cruiser (CL) HELENA had the more advanced SG radar.[81] At 2215 a scout plane off of SAN FRANCISCO reported unknown contacts. At 2325 the HELENA gained radar contact on an unknown contact at 27,700 yards that in turn broke into three distinct tracks. SAN FRANCISCO's SC radar was secured due to intelligence that Japanese ships had a receiver capable of detecting SC transmissions and was relying on her fire control radars to locate tracks

[78] Bruce Loxton and Chris Coulthard-Clark, *The Shame of Savo: Anatomy of a Naval Disaster* (Annapolis, MD: Naval Institute Press, 1994), 264.
[79] Ibid., 265.
[80] Morrison, 148, 150.

ahead of the ship. SAN FRANCISCO's fire control radars also did not hold the tracks held by HELENA. At 2330 RADM Scott, still unaware of the Japanese presence, ordered a countermarch to maintain position in the vicinity of the passage between Savo Island and Cape Esperance.[82] At 2240 HELENA was confident enough of her tracks to report them to the commander. However, by then they were at a range of 6 miles and still remained undetected by the SAN FRANCISCO.[83] The report from HELENA caused confusion as ships were still out of station because of the 2230 countermarch and because the flagship still did not hold contacts being reported by HELENA. SAN FRANCISCO gained radar contact on a track at approximately 2245, but was unable to discern whether it was a friend or foe. HELENA was confident the track was a foe, for she had been tracking it since before the countermarch. HELENA requested permission to fire and due to a communications mix up commenced firing, although the commander had not intended to grant permission to fire. Unlike at Savo, the Japanese were caught completely by surprise. RADM Scott was still unsure of the identity of the ships that his formation had engaged and fearing them to be friendly, ordered a cease-fire. Four minutes later Scott ordered resumption of firing. The opposing formations had closed to such a short range that they resorted to using spotlights to identify ships. This use of spotlights, however, provided a beacon to the Japanese gunners.[84] Although the American force did inflict severe damage on the Japanese formation (Cruiser FURUTAKA sank, destroyer FUBUKI sunk and cruiser AOBA severely damaged), two U.S. cruisers (BOISIE and SALT LAKE CITY) suffered sufficient damage to necessitate their leaving the theater for repairs and the destroyers MCCALLA and DUNCAN were lost.[85]

The next significant surface action in the waters around Guadalcanal was the Naval Battle of Guadalcanal cruiser action on 13 November 1942. In this battle HELENA and SAN FRANCISCO again saw action and like at Cape Esperance the commander (RADM Callaghan)

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[81] Ibid., 148, 154-155.
[82] Ibid.
[83] Ibid., 155-156.
[84] Ibid., 158, 160, 162-163.

was embarked on the Heavy Cruiser SAN FRANCISCO. The ships were stationed in a column formation, with the cruisers at the center of a column (ATLANTA, SAN FRANCISCO, PORTLAND, HELENA and JUNEAU in that order), four destroyers in the van and four destroyers in the rear. RADM Scott was embarked on the light cruiser ATLANTA, but not designated as the Officer in Tactical Command (OTC) because he was junior to RADM Callaghan. As the formation steamed to battle, as at Cape Esperance, the ships with the best radars were not in the lead positions within the formation.[86]

The light cruiser HELENA (SG radar equipped) was the first American ship to gain radar contact on Japanese formations at 27,000 and 32,000 yards as the American task force sailed towards the enemy. RADM Callaghan altered course of the column to starboard in order to avoid a head on clash, yet did not give the order to fire for ten minutes because his flagship did not have radar contact with the enemy. As the commander was attempting to sort out the situation, the lead American destroyer gained visual contact on an enemy destroyer at 3000 yards and maneuvered to engage with torpedoes. This unauthorized maneuver created confusion in the formation. The destroyer commander requested permission to fire, but by the time the commander granted it, the ship had lost visual contact. At 0145, 21 minutes after HELENA's first report, American ships were ordered to "Stand By to Open Fire!" At 0150 and at less than 2000 yards Japanese spotlights illuminated the American formation and commenced firing. When the order was given for the American ships to fire, it directed "odd ships commence fire to starboard, even ships to port," causing confusing in that the command did not account for which enemy targets each American ship held contact on or variances in gun sizes between the ships.[87] A general melee ensued in which the Japanese and American forces engaged each other at nearly point blank ranges with gunfire and torpedoes. The situation was so confused that RADM Callaghan at one point ordered his ships to cease-fire. Shortly before being killed, RADM Callaghan indicated his priorities

[85] Ibid., 168-170.
[86] Ibid., 237.

when he radioed "We want the big ones!," indicating the Japanese battleships. By 0200 the Japanese commander ordered his forces to withdraw. Although the American surface force had prevented the Japanese from bombarding the Marines ashore, had destroyed two destroyers and had severely damaged a battleship, the costs were high. The American force lost four destroyers and two cruisers, in addition to RADMs Scott and Callaghan.[88]

On the night of 14-15 November 1942 an American surface force consisting of two battleships and four destroyers under the command of RADM Lee met a Japanese force consisting of a battleship, four cruisers and a destroyer squadron. The American commander had served as director of fleet training before the war and was very knowledgeable about radar.[89] As the American force operated in the waters around Savo, they received intelligence from patrol boats that a significant enemy force was heading towards Guadalcanal, thus, unlike in previous battles, the presence of the Japanese was not a surprise. RADM Lee's task force remained in a column formation with destroyers in the lead, as the 14 Japanese ships divided into four separate groups.[90] Around 2255 on the evening of the 14th of November, radar onboard the flagship WASHINGTON detected a Japanese cruiser at a range of nine miles and at 2316 the commander ordered American ships to engage the Japanese ship. Although both American battleships held visual contact on the Japanese cruiser, the destroyers did not. As the American battleships engaged one Japanese group, American destroyers gained visual on a different Japanese formation and engaged it at 2322. The Japanese formation attacked by the American destroyers consisted of a cruiser and four destroyers. The Japanese severely outgunned the Americans and in short order had placed all four American destroyers out of action. At 2333 the American battleship SOUTH DAKOTA lost electrical power and with it situational awareness provided by radar. The SOUTH DAKOTA unintentionally maneuvered towards a Japanese force of

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[87] Ibid., 239-240, 242-243.
[88] Ibid., 251, 258.
[89] Ibid., 270.
[90] Ibid.,273-274.

destroyers, two heavy cruisers and a battleship, who attacked the blind American ship. WASHINGTON came to the aid of her sister battleship and although SOUTH DAKOTA was shot at with over 30 torpedoes and sustained 42 large caliber hits, she escaped destruction. The American destroyers were not so lucky, with three of four being lost.[91]

The last significant surface action in the waters around Guadalcanal was the Battle of Tassafaronga. RADM Kinkaid had been placed in charge of a cruiser and destroyer group and was tasked with preventing Japanese efforts to supply their forces ashore.[92] RADM Kinkaid drew up a detailed plan that called for dividing his force three groups (each formation having the better SG surface search radar equipped ship), leveraging use of aircraft to illuminate enemy ships, having destroyers make surprise attacks in advance of the cruisers, keeping cruisers at a range of 12,000 yards and withholding their fire until the destroyer torpedoes were near their targets so as to maintain the element of surprise and forbidding the use of spotlights. Although RADM Wright replaced RADM Kinkaid before the battle, he chose to keep the plan drawn up by his predecessor. On 30 November, RADM Wright maneuvered his ships to intercept a Japanese destroyer force attempting to supply their forces ashore Guadalcanal. The American force closed the Japanese in a column formation and did not place any screening destroyers ahead of the formation as called for in the operational plan.[93] The destroyers FLETCHER, PERKINS, MAURY and DRAYTON (in that order) led the column and were followed by the MINNEAPOLIS, NEW ORLEANS, PENSACOLA, HONOLULU and NORTHAMPTON with the destroyers LAMSON and LARDNER in the rear. At 2306 radar on the flagship MINNEAPOLIS picked up an unknown contact at a range of 23,000 yards. Ten minutes later the lead destroyer, detected an enemy contact at 7000 yards and asked for permission to fire. RADM Wright hesitated as he thought the range was too excessive to permit engagement. Four minutes later permission was granted, but by then the enemy ships had moved from the port bow to abaft

[91] Ibid., 275-278, 281.
[92] Ibid., 293.

of beam and were heading away from the American force. Two of the van destroyers did fire but their weapons stood little chance of catching the opening Japanese ships. With enemy ships at a range of five nautical miles, RADM Wright ordered the cruisers to open fire and the enemy destroyer force responded with a barrage of torpedoes as they maneuvered to withdraw.[94] Enemy torpedoes caused havoc as they damaged three cruisers and sank one, the NORTHAMPTON. In payment for this high toll, the Americans only sank one Japanese destroyer.

Though American surface forces significantly contributed to the land campaign on Guadalcanal, the cost was dire—six heavy cruisers, two light cruisers and fourteen destroyers lost. The Americans suffered these losses despite the fact that they sometimes held numerical superiority as at Cape Esperance and Tassafaronga and had radar superiority in all battles. There were a myriad of contributing factors to the American tactical shortcomings. Included among these factors were commanders continuing to operate in their "comfort zone" of outdated tactics, lack of understanding of new systems (specifically radar), paradoxical overconfidence in or over reliance on radar, inadequacy of systems (specifically radar) and the pattern of the American ships operating in ad hoc groups.[95] Each of these factors did impact the performance of the American surface forces, however, they are in and of themselves insufficient to explain the poor showing of the U.S. Navy. This is particularly true as such shortcomings were identified during early conflicts and addressed in battle plans, yet did not immediately result in significant changes in how American forces organized or fought.

A factor that must be considered when assessing the tactics and behavior of American commanders is the role of culture. In making a case for using culture as a relevant factor in the behavior of American commanders in the surface battles around Guadalcanal, it is significant that the battles occurred over the span of two months (four when Savo Island is included) and under four different commanders (five if Savo is included). Thus, the poor showing of the U.S. Navy

[93] Ibid., 284, 297.
[94] Ibid., 299-301.

cannot be blamed upon the negligence of one leader, or upon the inability to adapt because of inadequate time. The time that the U. S. Navy leaders had to prepare and adapt to the Japanese threat should not, however, be limited to the timeframe of the naval battles around Guadalcanal. The Japanese Navy had been the primary concern of the U.S. Navy for many years prior to the war and Americans had access to intelligence from British and other Commonwealth nations regarding Japanese capabilities.

Common threads exist when assessing how American commanders organized and fought during all of the surface actions around Guadalcanal. Culture serves as a tool with which to tie together seemingly isolated problems and explain the tactics and behavior of commanders. Later in the war when U.S. surface combatants did achieve lopsided victories, they were largely due to the breaking from cultural norms that had hamstrung commanders around Guadalcanal and were not due to technological upgrades.

The first cultural trait that adversely impacted American commanders was the rigidly hierarchical nature of the U.S. Navy. The first result of this hierarchical culture was an atmosphere in which rank mattered and was deferred to. This cultural trait had served the U.S. Navy well in the age of sail when it was critical that the guns of all ships be brought to bear in uniformity. It was, however, a liability in an electronic age and when individual ships had the capability to destroy opposing ships with a single salvo from their guns or torpedoes. In all of the major surface battles around Guadalcanal, commanders either maintained positive control over weapon systems of subordinate ships, or such control was perceived to exist by subordinates. In the battles of Cape Esperance, the cruiser action of 13 November and Tassafaronga, subordinate commanders who held contact with the enemy requested permission prior to firing. In all of these cases, requesting permission resulted in the loss of precious time. This behavior, however, was to be expected in a hierarchal relationship. In the remaining battle (Naval Battle of Guadalcanal battleship action) it was the commander who ordered the ships to commence firing, because the

[95] Ibid., 271.

flagship was the first American ship to gain radar contact on the enemy.[96] In short, a Navy hierarchical culture created an atmosphere in which superiors expected juniors to defer to their authority and both acted in accordance with these expectations. This type of command relationship, however, stifled initiative and resulted in the loss of precious time, particularly when a commander had less information with which to make decisions than his subordinates.

The second impact of this hierarchical culture was upon the stationing and maneuvering of ships. As the naval hierarchy assigned positions to individuals based upon rank, similar positions were assigned to ships. Furthermore, these assigned positions facilitated control. This hierarchal culture assigned major combatants to the center of a formation and smaller vessels to screening positions in order to defend against enemy destroyers or submarines. The primary purpose of these screening vessels was to permit the major combatants to bring their guns into action. Furthermore, the screening vessels were positioned to permit the commander to exercise control over them. In all of the surface actions around Guadalcanal the largest ships were stationed in the center of the formation, with destroyers in the lead and rear. Such an orientation allowed the main body to have a screen fore and aft, regardless of any course changes. Of significance is that the destroyers were maintained close to the main body, despite the fact that such a disposition was recognized to be inefficient by commanders such as RADM Kinkaid. Although this type of formation had the advantage of allowing effective control by the commanders, it restricted the ability of the destroyers to conduct independent action with their most lethal weapon, torpedoes.[97] Furthermore, when ships deviated from their stations in an uncommanded manner, as in the Guadalcanal cruiser action, confusion resulted. Thus, commanders in their desire to maintain control over their formations degraded the flexibility of their subordinates.

[96] Ibid., 274.
[97] Ibid., 314.

Another pattern of ship stationing was within the main body itself where the flagship normally took the lead. Of the four battles studied, only at the Battle of Guadalcanal cruiser action was the flagship not in the lead. In that battle the flagship of the Officer in Tactical Command (OTC) was second in line behind the light cruiser ATLANTA, where the veteran of Cape Esperance RADM Scott was embarked.[98] The positioning of the flagship in the lead of the main body would have been appropriate if the commanders were seeking to best command the battle. The motivation to exercise such command, however, does not seem to be the case as commanders always embarked in the largest ship, although such ships did not always have the best radar systems with which to maintain situational awareness.

The second aspect of Navy culture that had a significant impact upon the behavior of surface commanders was a culture that valued size and mass. This culture first had the impact of driving the choice of flagships by commanders. Traditionally, commanders embarked in the largest ships because they normally had the biggest/most guns and thus were the most capable. In the surface actions around Guadalcanal commanders always embarked in the largest ships. This choice of flagships had a decidedly deleterious effect during the battles of Cape Esperance and the cruiser action of 13 November where the commanders embarked the heavy cruiser SAN FRANCISCO, despite the fact that her radar was inferior to that of the light cruiser HELENA. This choice of flagships cannot be explained away by an inability of the commander to shift his flag under wartime conditions, because between these two battles RADM Scott had time to disembark SAN FRANCISCO and his superior RADM Callaghan time to embark. In both of these battles the commanders lacked enemy contact information and were unable to command effectively, primarily due to inadequate radar on the flagship. Such a situation could have been mitigated by the commander delegating authority in matters such as approval to open fire or maneuver independently, but such an action would have violated hierarchal relations. Instead, the

[98] Ibid., 237.

commanders called for radar information via radio circuits and wasted valuable time as they attempted to make decisions with inadequate information.

The second way in which a culture of mass adversely affected surface commanders was in how they prioritized and valued ships. The big gunned cruisers and battleships were more highly valued than the smaller destroyers or patrol craft, whose offensive potential seems to have been dismissed by the actions of American commanders. American destroyers were relegated to close escort of cruisers and battleships, and not permitted to operate in a manner that maximized their offensive potential. Although commanders had planned to use destroyers in a less tethered manner, they did not do so in actual combat. Furthermore, the potential of enemy destroyers seems to have been underestimated. This was seen in the cruiser action of 13 November where RADM Callaghan placed a priority on the large Japanese ships despite the fact that torpedoes had proved deadly in the earlier battle of Savo. This lack of regard by American commanders for Japanese destroyers would prove most disastrous at Tassafaronga where seven enemy destroyers damaged three and sank one American cruiser. Lastly, although there were American patrol boats armed with torpedoes in the waters around Guadalcanal, in none of the battles was there an attempt to integrate them into main force battle plans. In fact, in the battleship action of 14-15 November, RADM Lee's biggest concern with respect to the American patrol boats was avoiding being shot by them. The patrol boats, did however, provide some indirect information regarding another large force (i.e. Japanese) operating in the area.[99] This culture of mass led to an overemphasis on the larger capital ships and a corresponding lack of emphasis on the capabilities of smaller destroyers and patrol boats. This lack of balanced perspective on the part of American commanders created a situation where American capabilities were underutilized and enemy capabilities underestimated.

The third aspect of Navy culture that adversely impacted American performance was its elitist and racist nature. This culture created an environment where enemy capabilities and tactics

were measured against American standards. For decades the American Navy had considered Japan as the primary enemy in the Pacific and as such had tried to keep appraised of her military capabilities and tactics. Despite the fact that the Japanese remained very secretive regarding their tactics and weapons, intelligence did reach the United States Navy prior to the war. In 1938 or 1939 the Office of Naval Intelligence received reports from a reliable source regarding a 24 inch Japanese torpedo that was significantly advanced over the 21 inch American torpedo in terms of range, warhead, size and speed. This report was dismissed, however, because such technological capabilities were beyond those of the Americans, and thus thought to be beyond the Japanese.[100] This Allied disregard for Japanese capabilities was not limited to the assessment of torpedoes. After a crashed Japanese Zero was examined in China, its range was assessed to be 1500 miles. This assessment was corroborated by the fact that the aircraft had escorted bombers on missions of such ranges. The report was withdrawn, however, after the Bureau of Aeronautics stated that such a range was impossible.[101] Despite the fact that American commanders had very little actual experience with the Japanese, they felt racially, culturally, technically and mentally superior and were confident they would best the Japanese in any circumstances.[102]

American overconfidence, however, proved to be a significant liability because it endured even after the Japanese had proven their tactical and technical capabilities. After the defeat at Savo, officials cited surprise, fatigue and a lack of a battle plan as reasons for the loss. A reason not given at the time, however, was that the Japanese might simply be better than the Americans at night surface fighting. Such a conclusion ran counter to a Navy culture that extolled the technical, tactical, training, cultural and racial superiority of America. As a result of this elitism, later American losses were chocked up to poor decisions by commanders, confusion caused by ill-timed or unplanned maneuvers or plain bad luck and not to the superior skill and

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[99] Ibid., 273.
[100] Loxton, 46.
[101] Ibid., 47.
[102] Ibid., 48.

flexibility of the Japanese Navy. In short, American commanders continued to view the surface combat through a U.S. perspective and tended to dismiss Japanese capabilities, resulting in a dangerous clinging to prewar linear tactics.

The forth aspect of Navy culture that adversely impacted American performance was its emphasis upon order and efficiency. This emphasis upon order is most clearly demonstrated in the linear formations that the American groups repeatedly utilized as they went into battle. These battle lines were further organized with destroyers in the van and rear and main line ships in the center, with the heavier ones normally at the head of the formation. This pattern was manifested in all four of the battles examined. Even more amazing is that the American task forces maintained their linear formations at the commencement of hostilities, with the exception of destroyers maneuvering in order to bring torpedo tubes to bear on the enemy or other ships maneuvering to avoid enemy fire. One of the most significant results of this maintaining of ordered formations by the Americans was that the ships were much more vulnerable to mass enemy torpedo attacks, standard practice for Japanese destroyers and cruisers. The most significant example of this vulnerability was at the battle of Tassafaronga where Japanese destroyers scored hits on four out of five American cruisers steaming in formation, sinking one of them.[103] The linear and ordered fighting style of the Americans further played into the hands of the Japanese who practiced flexibility and separating into smaller formations. At the Battle of Guadalcanal battleship action, the Japanese were able to attack from multiple directions without radar by using the single linear formation of RADM Lee as a point of reference as they attacked and retired.[104]

The second way in which American emphasis on order and efficiency hindered American surface forces was that it contributed to commanders placing those virtues over flexibility and effectiveness in battle. An example of this was in the Naval Battle of Guadalcanal cruiser action

[103] Paolo E. Coletta, *The American Naval Heritage*, fourth ed. (Lanham, MD: University Press of America, 1997), 266.

where RADM Scott ordered even ships in the formation to fire to port, and odd ships to fire to starboard. Such a command was ordered and was efficient if the commander was seeking to minimize duplication of effort with respect to expending ordinance on enemy ships. The command, however, did not account for the differing caliber of the weapons of the ships or for which ships held contact on the enemy and in the end led to confusion.[105] A quest to maximize efficiency and order had the unintended consequence of leading to confusion and adversely impacting combat effectiveness of the American force.

With the advent of radar, the United States Navy had fully entered the electronic age. Entry into this new age was abrupt and the cultural norms and characteristics of the Navy had not kept pace with this new technology. As ships were rapidly outfitted with radar, Navy culture remained rigidly hierarchical, valued physical mass, was elitist and was obsessed with efficiency and order. These values had served the U. S. Navy well for generations, yet were out of place in this new electronic age. These cultural values influenced commanders to select flagships from which they could not command. They caused leaders to view the enemy from an American perspective and to discount enemy tactics and capabilities. They led commanders to keep their ships in tight linear formations, instead of allowing them freedom of movement and action. American commanders knew that these actions were not conducive to fighting a skilled and flexible enemy, yet continued in these patterns. Culture is a contributing factor of explaining why such decisions were made, particularly in the heat of battle where logic and rationality can evaporate. Culture is generally neutral and is most often rooted in sound principles that have served an institution well. Culture, however, can be a liability when it does not adapt to changing times and technology. In early surface actions in the Pacific, it seems culture did fail to adapt quickly enough.

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[104] Morison, 276.
[105] Ibid., 243.

The aggregate failures of the U.S. Navy in the waters around Guadalcanal did, however, set the conditions for change. In February of 1943 Captain Arleigh Burke was assigned as commodore of Destroyer Division 43, which was standing up in the South Pacific. After an analysis of surface actions, Capt. Burke espoused tactics that previous commanders had envisioned yet never executed such as van destroyers upon detection of enemy ships initiating "a coordinated torpedo attack WITHOUT ORDERS."[106] Capt. Burke along with RADM Aaron S. "Tip" Merrill and Commander Frederick Moosbrugger continued to refine surface tactics that involved quasi-independent destroyer operations and the use of divided forces at night.[107] What was radical about the concepts of Capt. Burke, if actually practiced in combat, was that they were a shift away from prevailing cultural norms that valued hierarchal relations, mass and order.

The first test of the tactics of Capt. Burke was at the Battle of Empress Augusta Bay where a force of four cruisers and two groups of destroyers under RADM Merrill were tasked with blocking a similar force of Japanese ships seeking to oppose an American landing. In the battle, destroyers under Burke attacked according to plan without orders as the cruisers acted as a covering force behind the destroyers at the entrance to Empress bay.[108] Although the attack was not a decisive victory, the Japanese ships retired. Two critical aspects of the battle, however, were that subordinates acted independently and that the main body of cruisers had acted in support of the destroyers; this was a reversal of roles.

These types of operations would continue with Burke's destroyers autonomously. On 25 November a formation of destroyers operating independently under Commodore Burke sank three Japanese destroyers and damaged one Japanese destroyer, with no American losses.[109] These independent surface operations reached their height at the Battle of Leyte Gulf where patrol boats, destroyers, cruisers and battleships attacked an opposing Japanese surface force

[106] Coletta, 270.
[107] Ibid., 272.
[108] Ibid., 276.
[109] Ibid., 277.

independently and over an extended distance. The linear battle line of two years earlier that primarily sought to bring guns to bear on an enemy had been discarded in favor of a decentralized architecture in which the weapons and sensors of all platforms were fully utilized. Navy culture did not radically transform, but it had learned to live with subordinates acting independently, "disorganized" formations and non-capital ships (i.e. no big guns) being critical components of a task force and a battle plan.

CHAPTER FOUR

CONTEMPORARY NAVY CULTURE

Before addressing the current Navy transformation efforts it is critical to understand the current condition of Navy Surface culture. In the sixty years since the war in the Pacific, U.S. Navy culture has changed in order to accommodate changing society, a different world order and new technology. Many elements of Navy culture, however, remain much as they were during World War Two. The application of the White cultural model paints a picture of contemporary surface Navy culture. Technologically, surface Navy culture is rooted in the "prestige of things," with speed and size being two of the most significant physical characteristics. [110] Sociologically, surface Navy culture is hierarchical and based upon accountability. Ideologically, surface Navy culture is Newtonian in its outlook; it is self-reliant, and traditional and it places value upon smartness and precision. When examining contemporary Navy culture, I will specifically focus on the sub-culture of the Surface Warfare community where applicable. This focus was not practical when examining pre-war Navy culture as surface culture dominated and because there are only limited sources that describe a distinct surface sub-culture apart from the broader Navy culture. In contemporary Navy culture, however, the surface community does not dominate. Instead, it occupies equal or nearly equal positions with the aviation and submarine communities.

White defines technology as "tools and weapons and the techniques of using them."[111] Although battleships are relegated to museums, the "prestige of "things"" is still alive with capital ships (specifically those with the Aegis weapon system) remaining at the top of the food chain within the Surface Warfare community. [112] There are three significant categories of ship types: combatants (CRUDES for cruiser and destroyer), logistics (CLF or Combat Logistics Force) and amphibious. Of these three categories the most prestigious is the combatant force and specifically

[110] Sheila Scarborough, CDR, USN, Network-Centric Warfare Meets the Laws of the Navy," *United States Naval Institute Proceedings* 127, no.1,179 (May 2001):33.
[111] White, 17.

those ships with Aegis weapons system. The prestige of Aegis is so significant that one Navy spokesman stated "if it's not Aegis, it simply doesn't have a significant role in our future."[113] One thing that sets Aegis ships apart from their predecessors is the speed with which their combat system functions. Computers control all aspects of radar operation, weapon selection and control and information management, enabling the ships to engage targets in numbers undreamed of in previous warships. In an age of supersonic anti-ship cruise missiles, the quality of speed is to be valued above all others. Computers not only control the combat suite on Aegis ships, but also damage control systems, ship control systems, engineering systems and communication systems, making speed and efficiency defining traits of the platforms.

Speed, however, is not the only technological trait valued by the surface community. Size is still revered and is seen as essential in the rating of a warship. Throughout the 20th century the Navy has eschewed smaller combatants in their "Total Ship Battle Force" (TSBF), preferring instead to build larger combatants. This emphasis upon larger ships in the makeup of the battle fleet has manifested itself in recent history with the rejection of the PHM class hydrofoils in the early 90s and in disdain for the CYCLONE class PCs in current service.[114] The Navy envisions future capital ships as being even larger than current combatants, with the "downsized" DD(X) being on the order of 12,000 tons (approximately 3000 tons larger than current destroyers) and the small LCS (Littoral Combat Ship) will be capable of embarking SH60s and is projected to displace between approximately 2000-2800 tons.[115] [116] Size is generally used as a measure of capabilities and drives which upgrades and capabilities ships receive. Aircraft carriers and command ships are outfitted with the most current communications technology, followed by

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[112] Scarborough, 33.
[113] Pat Towell, "Navy Caught in Budget Squeeze as Urgency to Build Ships Grows," *Congressional Quarterly Weekly* Vol. 60 Issue 8, p540, 23 February 2002 [journal on-line]; available from http://web4.epnet.com; Internet; accessed 10 March 2004.
[114] Robert A. Work, *The Challenge of Maritime Transformation: Is Bigger Better?* (Washington: Center for Strategic and Budgetary Assessments, 2002), I, 115-116.
[115] Global Security, *DD(X) Multi-Mission Surface Combatant Future Surface Combatant*: available from http://www.globalsecurity.org/military/systems/ship/dd-x.htm; Internet; accessed 10 March 2004.

cruisers and so forth with the small frigates being last in line. When there is a budget shortfall, inevitably it is the smaller ships that suffer. For example, as FFGs (the smallest surface combatant class) that are having their MK13 missile launchers removed without a system to replace it. As during the 1930s, the size and capabilities of a warship are commensurate with the rank of the commander. For officers who have grown up aspiring to higher levels of command at sea, a reduction in the quantity of larger combatants would not sit well. With an average service year life of 35 years for surface combatants, Navy surface culture is not about to forgo size as a measure of value in the near term.[117]

White defines sociology as the "customs, institutions, codes and etc" of a group.[118] Sociologically, contemporary Navy surface culture is still very much hierarchical and based upon accountability. Although the current Navy is not as rigidly hierarchical as during the 1930s, multiple hierarchies still pervade Navy surface culture. When U. S. warship ships encounter one another upon the high seas, they exchange calls via flashing light or radio and the junior "requests permission to proceed on duties assigned." Beyond this largely symbolic gesture (as a senior ship would rarely, if ever, deny such permission), rank is thrown around as ships with senior commanders bump junior ones in order to pull into port early or as commanders vie for assuming more prestigious positions, such as primary air defense commander, within a battle group.

Onboard ships, the prerogative of commanding officers (COs) may not be that of a sovereign, but it is still significant. Commanding officers have significant privileges and power in almost all areas of shipboard life. They can summarily punish sailors at Captain's Mast, change the configuration of their ship (an often illegal, but common practice) and they have the largest accommodations. Furthermore, commanding officers maintain a high degree of control over and involvement with the daily operations of surface combatants. It is normal for the CO to stipulate

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[116] Robert A. Work, *Naval Transformation and the Littoral Combat Ship* (Washington: Center for Strategic and Budgetary Assessments, 2004), 118.
[117] Work, *The Challenge of Maritime Transformation*, 67.
[118] White, 17.

that no course or speed changes be made without his express approval, require notification if any vessel passes within 5 nautical miles of the ship, sign off on all official correspondence (paper and electronic) leaving the ship, give permission to dump trash, approve watch bills and approve navigation tracks. For personnel subordinate to the CO of a ship, rank is still important as it determines berthing assignments, where one eats, what watches and responsibilities one can assume (e.g. only officers are permitted to stand Officer of the Deck while underway) and one's pay. This hierarchical culture is embodied in the chain of command where juniors report upwards to seniors. Adherence to the chain of command is expected and violation of it is viewed as being disloyal.[119] In this hierarchical culture, rank affords both tangible and intangible benefits, but they come at the price of strict accountability. That Navy surface culture holds individuals accountable for their actions is clearly evident in the recent spat of firings of commanding officers (22 in 13 months).[120]

Tied to a culture of strict accountability is a culture of risk averseness. A surface combatant is a dangerous working environment and numerous precautions are enacted to ensure safety of ship and crew. Included among these precautions are Personal Qualification Standards (PQS), checklists, Standard Operating Procedures (SOPs) for engineering and combat systems, screening of watch standers by senior officers and direct supervision by officers or senior enlisted. All of these precautions serve to mitigate risk, but can also create the perception that all risk can be leveraged out of an organization. This desire to keep risk levels low is because a significant accident such as a grounding or collision is a career killer for a commander. Although smaller accidents such as a fuel oil leak or injury to a crewman may not result in the loss of a command, if definitely reflects poorly upon a command and thus the commander. Admiral Cebrowski argued that this culture of being " 'risk averse' in general and 'risk deterred' in

[119] Scarborough, 33.
[120] Matthew Dolan, "Increasing Number of Navy Offices Getting Fired," *Norfolk Virginian-Pilot*, 10 March 2004, available from http://ebird.afis.osd.mil/ebfiles/e20040310265158.htm; Internet; accessed 11 March 2004.

particular" was hindering efforts to push forward with smaller vessels capable of operating in the littorals.[121]

According to White, ideology consists of the "ideas (concepts) and beliefs" of a group.[122] Ideologically, the United States Navy is mechanical, traditional, self-reliant and places value upon smartness and precision. The surface fleet of the United States Navy is highly technical and continues to get more so. This technical aspect of surface warship technology has resulted in a culture that is rooted in the linearity and predictability of engineering and Newtonian science. This cultural mindset subtly impacts the behavior of commanders as they view war as "deterministic, in that it has rules that connect the state of phenomenon at one moment to the next."[123] This scientific and mechanical mindset is further reinforced by the educational emphasis of the Navy. The Naval Academy is still a highly technical institution and "bull" majors such as history, economics, English and political science are all viewed as less desirable and "cop outs" for people who can not hack the hard sciences. This emphasis on technical education is not, however, restricted to the Academy.[124] Beyond the emphasis on technical majors, the Navy as a whole does not place a premium on graduate level work or "any school or professional military education."[125] A review of the curriculum at the Naval Postgraduate School (NPS) in Monterey California shows that postgraduate educational opportunities are highly biased towards the

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[121] Work, *Naval Transformation*, 50.
[122] White, 17.
[123] Aaron Scholer, "The Return of Friction and the Transformation of US Naval Forces in the 21st Century," *Proceedings: Political Research Online* [papers from the 2002 Annual Meeting of the American Political Science Association.]; available from http://apsaproceedings.cup.org; Internet; accessed 01 March 2004, p 15 of 39.
[124] Scarborough, 32.
[125] Williamson Murray, "Clausewitz Out, Computer In: Military Culture and Technological Hubris," *The National Interest*, 01 June 1997; available from http://wwwclausewitz.com/CWZHOME/Clause&Computers.html; Internet; accessed 18 February 2004; Panel on Human Resources, *Technology for the United States Navy and Marine Corps 2000-2035: Becoming a 21st Century Force*, vol. 4, *Human Resources* (Washington: National Academy Press, 1997) 15-16.

technical, scientific and mathematical. [126] Despite the presence of non technical majors such as National Security Affairs, the number of openings for Surface Warfare Officers is extremely limited, with openings normally only being open to Surface Warfare officers who have obtained a "silver bullet" through the completion of an undesirable assignment. The saying "Sea or DC" sums up the attitude that Surface Warfare officers either should be driving ships or working the political aspect of the Navy, and should not be distracted by advanced education. This attitude is further driven home by the consistent mantra by the Bureau of Naval Personnel (BUPERS) that "sustained superior performance at sea" is the key to selection to career milestones and promotion. While it is true that graduate degrees are looked upon favorably, they are by no means mandatory and simply having a degree is more important than where/ how it was obtained or the field of study. In short, graduate degrees are often little more than a "check in the box" for Surface Warfare Officers.

Closely tied in with a mechanical view of the world is an emphasis upon smartness and precision. In a survey conducted during the late 1980s, 92% of senior Surface Warfare officers believed that smartness, precision and the chain of command were important. [127] Within the surface community, smartness and precision are valued for two main reasons. First is because of a Newtonian world-view. In a mechanical and technical world things are designed to run in an orderly and predictable pattern. Things that do not run in this manner are either poorly designed or are not functioning properly, thus smartness and precision are measures of how well something is operating, be it a ship or an engine. The second reason is based upon the isolated nature of surface ship operations. The superiors of ship COs often do not have much direct interaction with ships, unless they happen to be embarked on them. As a result, a majority of their perception with respect to how a ship is functioning (a direct reflection upon the commander) is a result of

[126] Naval Postgraduate School, "NPS Curriculum Summary," available at http://www.nps.edu/Academics/Content/CurrAlphabet.html; Internet: accessed 04 April 2004.
[127] William Burcham, "Delay in the Evolution of Tactics Following the Introduction of New Technological Products in the U.S. Navy" (Ph.D. diss., The George Washington University, 1991) 244.

external things such as how clean she is, how much rust is showing, how crisp her radio traffic is and how smartly the ship gets into station during fleet maneuvers. As a result great emphasis is placed upon running the ship in a precise and smart manner, lest a clumsy radio operator or sloppy ship handling reflect poorly upon the entire ship. Such an attitude results in ships laying to off the coast of Virginia after a six-month deployment in order to touch up the paint on the hull or cutting off topside brackets lest they interfere with preservation (i.e. they rust).

Another cultural trait of the Navy in general, and specifically of the Surface Warfare community, is that it views tradition as important and is conservative. In a survey conducted in the late 1980s, 80% of officers viewed tradition as being important and over 90% believed the Navy was a conservative organization.[128] These traits are manifested in minor things such as using a boatswains pipe to pass word over 1MC amplified circuit and major things such as officers maintaining eating and berthing spaces separate from enlisted.

Lastly, the surface navy has a culture of self-reliance. This culture of self-reliance is born out of operating forward deployed where physical support and technical assistance are often unavailable. U.S. Navy warships have been built with maintenance in mind. Navy ships carry well-stocked storerooms and highly skilled repair personnel. This culture of self reliance has further been reinforced by the fact that ship degradations are not looked upon favorably by seniors and because superiors look favorably upon the ability of a crew to take care of its own problems. Although not official policy, ship commanders view it as a shame to fail to meet an operational commitment due to some type of material deficiency. Furthermore until recently it was common practice to use the number of casualty reports (CASREPS) on a ship as measure of how “squared away” a ship was.

In conclusion, contemporary U.S. Navy surface culture still embodies many of the same attributes that it held during the 1930s. Technologically, surface culture prizes speed and size. Sociologically, surface culture is hierarchical and based upon accountability. Ideologically, it is

mechanical, self-reliant, traditional, and it places value upon smartness and precision. These characteristics define Navy surface culture and have served the service well during the decades of the Cold War. They are, however, increasingly out of step with efforts to integrate Network Centric Warfare technology onto U.S. warships. As Navy culture adversely impacted the effective integration of radar technology onto the surface combatants in the opening year of World War Two in the Pacific, it similarly has the potential to impede the progress of NCW.

[128] Ibid, 235, 261.

CHAPTER FIVE

NAVY TRANSFORMATION

"We don't know what the web is for, but we've adopted it faster than any technology since fire."[129]

In May of 2001 President Bush outlined a vision for transformation of the military that would create a force "defined less by size and more by mobility and swiftness, one that is easier to deploy and sustain, one that relies more heavily on stealth, precision weaponry and information technologies."[130] The Navy translated this broad vision for a future military force into more tangible goals and projects with the promulgation of the Naval Transformation Roadmap, signed by the Secretary of the Navy, Chief of Naval Operations and Commandant of the Marine Corps in July of 2002.[131] The linchpin of the Naval Transformation Roadmap is the ForceNet concept. ForceNet is "the future implementation of Network Centric Warfare" and seeks to link "dispersed, human, decision-makers to leverage military capabilities to achieve dominance across the entire mission landscape." The system is mission-tailorable and focuses upon delivering information to "decision makers."[132] In short, ForceNet leverages information technology so as to speed the dissemination of information and reduce the fog of war.

Much of the vision behind the concept of Network Centric Warfare (NCW) comes from the revolutionary ways that businesses have changed in order to compete in a globally interconnected market. In this "new economy" information is the most valuable of resources and

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[129] David Weinberger, "The Longing," in *The Cluetrain Manifesto: The End of Business as Usual*, Levine, Locke, Searls and Weinberger [book on-line] (Clutrain.com, 1999, accessed 10 march 2004): available from http//www.cluetrain.com/book; Internet, 4.

[130] Remarks by the President at the U.S. Naval Academy Commencement, [May 2001]. available from http://www.whitehouse.gov/news/releases/2001/05/20010525-1.html; Internet; accessed 24 February 2004.

[131] NAVSEA Reserve Program Strategic Program Realignment Alternatives Group (SPRAG), *Naval Transformation Roadmap*: available at: (http://e-reservist.net/SPRAG/CNO%20Naval%20Transformation%20Roadmap_files/frame.htm); Internet; accessed 11 March 2004.

flexibility is the key to survival. The tale is told of how leviathans such as IBM almost failed, while agile upstarts such as Dell seized significant market share.[133] The moral of such stories is that businesses need to get connected, listen to their users and be flexible in order to survive in this new information age. Information technology provided the promise of greater productivity, intelligence and adaptability.[134] These benefits, however, did not come without organizational and cultural costs. To leverage information technology three conditions were vital. The first was "an outside-in, solution-driven reorientation." This orientation was one in which organizations sought the free flow of information from outside the organization and facilitated the movement of that information once it was within the organization. The net result was that end users, irrespective of their position within the organization, were empowered. In short, information became free and available. The second change was a much greater "dependence on employees' talent and initiative (not just their labor)." This condition was one in which all employees within an organization were highly valued, regardless of their tenure or position. The third change was "relentless but trustful leadership." This condition existed when leaders learned to relinquish control of many aspects of a businesses operation and instead focused on providing strategic direction.[135]

Just as the information technology revolution in the business sector was predicated upon certain organizational and cultural conditions, so is Network Centric Warfare. Beyond the simple procurement of the hardware and systems associated with NCW, changes to cultural and organizational characteristics are recognized as being essential. Characteristics Navy leaders have identified as being critical to fighting in an age of networked combatants are being connected, modular, off-board and unmanned.[136] In addition to that officially sanctioned list, the nature of

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[132] United States Navy, "Naval Transformation Roadmap," available at http://www.onr.navy.mil/ctto/docs/naval_transform_roadmap.pdf; Internet; accessed 14 March 2004. p. 5 of 44.
[133] David Gompert and Irving Lachow, "Transforming U.S. Forces: Lessons From the Wider Revolution," RAND *National Defense Research Institute website*; available from http://www.rand.org/publications/IP/IP193/; Internet; accessed 10 March 2004. p. 4-5 of 17.
[134] Ibid, p. 3 of 17.
[135] Ibid, p. 4-7 of 17.
[136] Work, *Naval Transformation*, 75.

NCW demands that the traits of uncommanded, uncontrolled and educated be added to the above list.

Connected simply means that all vessels within a battle force are "inextricably connected" and is largely a function of hardware and systems.[137] Modularity indicates that ships are capable of being rapidly reconfiguring so as to complete different missions. Off-board indicates that surface combatants will increasing rely upon off-board systems in order to complete their mission. Unmanned means that numbers of people onboard ships will be reduced by the leveraging of off-board systems and reach back capabilities.[138] This unmanned goal is desirable because it places fewer individuals in harm's way as well as eliminating overhead associated with supporting large crews. This unmanned vision is clearly seen in the DD(X) concept where a crew of 95 will carry out functions comparable to a World War Two cruiser, which had a crew of approximately 900 men.[139]

The characteristic of being uncommanded indicates that in the information age the nature of command is fundamentally different than in the industrial age. It indicates that command will not be the sole responsibility of one individual, but shared and distributed.[140] This concept is born of the business world where broad authority and control has been pushed down to the lowest levels. For years the Navy has practiced a type of uncommanded organization with the Composite Warfare Commander (CWC) concept. The CWC concept permits the battle group commander to delegate functional areas such as air defense, anti-submarine warfare or helicopter control so as to unburden the commander of excess tasks and to allow rapid reaction in a fast paced battle environment. The commander always, however, retains "control by negation" authority or the ability to step in at any time if he does not approve of what a subordinate is doing. The ability of

[137] Work, *Naval Transformation*, 76
[138] Work, *Naval Transformation*, 77
[139] William D. O'Neil, "The Naval Services: Network-Centric Warfare," in *Transforming America's Military*, ed. Hans Binnendijk (Washington: National Defense University Press, 2002) 144.

superiors to maintain control is further exercised through detailed guidance in the form of Operational Tasks (OPTASKS), Operational Plans (OPLANS), Fragmentary Orders (FRAGOs) or other supplemental instructions. The level of granularity of these instructions varies greatly, but often it is very detailed and does not grant subordinates much flexibility or room for deviation without permission from the commander. Beyond procedural measures that commanders use to exercise command within the CWC organization, they also use technology and connectivity to micromanage and maintain control. It is not unusual for commanders to query warfare commanders regarding current operations. As connectivity increases, this temptation for superiors to become even more involved in the operations of subordinates is increased. With increased involvement by superiors, the natural tendency of subordinates will be to either let the commander take over or to obsess with those specific details the commander is interested in. Both of these situations are contrary to the concepts of NCW. Although the characteristic of being uncommanded may exist in a primitive form with the CWC concept, its principles are not universally adopted across the fleet and at all levels of command. Clearest example of where command is not delegated being on surface ships.

Closely tied in with uncommanded is being uncontrolled, because control is one of the traditional manifestations of exercising command. In the Information Age, one or even a few people are incapable of exercising control because of the sheer volume of information and speed with which it flows. Instead, power must be pushed to the edge where "the organization interacts with its operating environment to have an impact or effect on that environment."[141] If information technology is simply used to facilitate the rapid flow of information to centralized decision makers, the potential for increased productivity is only slightly increased because those individuals can only process a finite amount of information in a given time period. If multiple

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[140] David Alberts and Richard Hayes, Power to the Edge: *Command and Control in the Information Age* (Washington: DoD Command and Control Research Program, 2003) [book on-line]; available from http://www.dodccrp.org/Publications/pdf/poweredge.pdf; Internet; accessed 10 March 2004, p. 144 of 259.
[141] Ibid, p. 5 of 259.

individuals on the edge of an organization are empowered, the potential for increased efficiency and speed is vastly greater. A key characteristic of being uncontrolled is the concept of "post before processing." In this concept, a producer of information posts (i.e. disseminates to those who desire to pull it) raw or nearly raw information without having processed it.[142] The key factor here is how rapidly information is available to other users. This concept is contrary to traditional concepts of control because it demands that individual organizations immediately relinquish control of information for the benefit of the system as a whole.

The necessity for education is vital because reduced manning and NCW depends upon better-trained sailors and leaders. With reduced manning, fewer people are called upon to complete tasks previously accomplished by more individuals. Network Centric Warfare forces command and control to increasingly lower levels, necessitating that those individuals be capable of executing those responsibilities and making decisions that previously would have been executed by senior or more experienced individuals. The Navy has recognized the need for increasing the caliber of naval personnel through the Sea Warrior initiative that seeks to "maximize human capital."[143] Among its key initiatives are recruiting superior personnel, increasing educational opportunities, improving training and more effectively employing personnel. In short, the Navy is taking steps to place greater value in people and to move away from what has been referred to as a conscript mentality.[144]

Department of Defense and Navy visions for transformation place a great deal of reliance upon gaining and maintaining information superiority. Central to gaining this superiority is through Network Centric Warfare concepts and specifically with ForceNet for the Navy. These concepts are not restricted to technology, but also rely on changing existing culture and organization so as to be able to fully leverage the potential promised by Network Centric Warfare. Radar represented a quantum leap forward in technology and war fighting capabilities.

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[142] Ibid, p. 83 of 259.
[143] United Sates Navy, *Naval Transformation Roadmap*, p. 28 of 44.

Network Centric Warfare promises a similar move ahead in war fighting capabilities. The problem is that the influences exerted by culture are subtle and culture is slow to change. Leaders must understand that culture will impact the actions of contemporary leaders just as it influenced the actions of surface force commanders in the Pacific during the Second World War.

[144] Scarborough, 32.

CHAPTER SIX

RECONCILING NAVY CULTURE AND CURRENT TRANSFORMATION

Network Centric Warfare is a 21st Century technological analog of radar. When radar was introduced, leaders envisioned a surface fleet operating with greatly increased situational awareness and being able to "see" in the dark. Network Centric Warfare visionaries make even bigger boasts, claiming the technology "promises the capability to use military force without the same risks as before—it suggests we will dissipate the 'fog of war'"[145] Although NCW has great promise, it also has potential weaknesses such as technical and organizational vulnerabilities. Adversaries can operate outside the "view" of our information network and enemies could possibly use NCW principles and technologies to construct their own networks. Setting aside these real vulnerabilities, the more pressing question is how contemporary Navy surface culture will react to NCW systems. Network Centric Warfare technologies hold the potential to clash with Navy culture and such a dynamic would inevitably reduce the potential promised by this new technology.

On the surface it is clear why from a technological and doctrinal perspective Navy culture is embracing Network Centric Warfare concepts. The Navy is highly technical and is constantly looking for systems to do things faster and more efficiently. The Navy has had tactical data links for nearly fifty years and NCW seems to be the next logical step in utilizing networks to fight at sea.[146] The Composite Warfare Commander (CWC) doctrinal concept has been standard fleet

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[145] Murray, *Clausewitz Out*, 6.

[146] George Gray, "Sperry Rand Military Computers 1957-1975," *Unisys History Newsletter* Volume 3, Number 4 August 1999 [Journal on-line]; available from http://www.cc.gatech.edu/gvu/people/randy.carpenter/folklore/v3n4.html; Internet; accessed 12 March 2004.

operating doctrine for decades and employs decentralization and empowerment of subordinates to facilitate rapid reaction in a complex and fast paced battle environment—two traits of NCW.

There are, however, technological aspects of Navy surface culture that are destined to hinder the effective implementation of NCW. Current Navy surface culture is still slaved to a technological mindset that places preeminence upon the physical characteristics of warships, specifically in their size (tons) and war-fighting capabilities (number and type of missiles, type of radars, types of weapon systems, age and crew size and qualifications). This mindset places greatest value upon High Value Units (HVUs) such as aircraft carriers and Aegis ships. NCW, however, is predicated upon the principle that any unit could potentially possess critical information or make essential decisions. Current attitudes and practices (specifically funding for repairs and upgrades) continue to favor the largest and most capable ships. As a result, command and control (C2) disparities exist between platforms. If the Navy continues to employ traditional evaluation criteria in ranking ships when deciding how to prioritize modernization funding, a significant portion of the battle fleet will remain less than fully integrated. Such a situation would make true and complete NCW impossible.

Adequate funding and uniform installation of C2 hardware, however, would not in and of itself serve to break through the barrier created by a technological mindset that ranks ships based upon their size and capabilities. The reason is because this technological mindset has codified a hierarchical ranking for classes of ships that significantly impacts the opinions of operators and commanders with respect to different types of ships. This hierarchical attitude views a cruiser as superior to a frigate because the cruiser has better radars, carries more missiles and has a larger crew. Thus, even all ships may be fully networked and their commanders of the same rank, the input of all ships may not be equally valued because of technological hierarchical biases. Such a hierarchical technological mindset is inherently contrary to the empowering and inclusive concepts of NCW.

Educational priorities the Navy has perpetuated to support a highly technical organization is another area where Navy culture will inevitably clash with NCW. Traditionally the Navy has promoted engineering and science based education, and this emphasis has not significantly shifted. Furthermore this technical education is in keeping with the Navy's linear Newtonian ideological view of the world. The problem with this educational focus and the linear problem solving it promotes is that NCW is based upon principles of chaos, flexibility and a lack of order. A greater emphasis needs to be placed upon educational backgrounds that provide the mental tools and framework for operating in an environment where problems without mechanical solutions will arise and where an innate knowledge of other cultures and regions facilitate the decision making process. The shortcoming of the current educational system and detailing process is that it does not seek out individuals with liberal educations, does not promote higher degrees in non-technical/scientific fields and does not encourage exposure to other cultures. The Surface Warfare community must elevate the status of liberal education if they are to succeed in a network centric age of warfare.

Network Centric Warfare will inevitably encounter significant problems when it experiences the core sociological attributes associated with Navy surface culture. The first sociological aspect of Navy surface culture that clashes with the tenants of NCW is its hierarchical nature. Just as hierarchies exist within the technological realm, they also exist among communities, billets and individuals. Within the Navy there are two classes of officers, line and restricted line. Of the two, line officers occupy a higher relative position. Beyond this broad hierarchy, there are numerous other hierarchies. Among all of the Navy communities, war fighters, such as Surface Warfare Offices, Aviators and Submariners occupy a higher status than individuals in non-war fighting fields such Human Resources(HR), Navy Space and Information Technology(IT).[147] Within the Surface Warfare community, hierarchies also exist with the less glamorous mine warfare and CLF being near the bottom and Air Warfare Commander being near

the top. Positional hierarchies also exist among sea going and non-sea going billets and commands, with the higher prestige going to afloat commands. Lastly, rank is the ultimate and most pervasive segregator of individuals (and their commands) as it determines what privileges and authority they are entitled to. The prerogative of rank is understood and deferred to by all within the chain of command. It is not unheard of for the captain of an Aegis cruiser to force a frigate to get underway long enough to secure the cruiser a pier side berth for his ship or to move his ship ahead of a destroyer waiting to enter port. The most significant and broad manner in which the hierarchy of rank leaves its mark is in its segregation between officers and enlisted. Further segregation even occurs within the officer and enlisted communities as they are broken into junior, mid-grade and senior categories. In short, the Navy is a system of multiple hierarchies that equates the worth of individuals (or their command) with their relative position. This system of hierarchies furthermore also assigns value to information coming from different individuals or commands.

Such a hierarchical culture is worrisome because Network Centric Warfare is based upon the concept of empowering all sailors in the network and valuing their information, regardless of their location, position or rank. In NCW, the surface community will have to rely unquestioningly on information from ashore, from non-war fighters and from individuals of much junior rank. A premium must be placed upon the information and not on the "credentials" of the individuals or organizations providing it. If the surface community continues to rank individual and commands and their information based upon hierarchical models and not solely upon its merit, timeliness or utility much of the potential of NCW will be lost.

Closely tied with this system of hierarchies is the Navy concept of command. The tradition of absolute command and accountability residing on one individual is almost as old as the sea and is deeply engrained in Navy surface culture. To fully embrace the concept of NCW, however, traditional concepts regarding command must be modified. In NCW, subordinate war

[147] United States Navy, *Naval Transformation Roadmap*, p. 31 of 44.

fighters will be "self synchronizing" or capable of making and executing decisions independently with only broad commanders intent.[148] This delegation, however, is not limited to a trusted few, but to the lowest levels of the chain of command. Such an organization must be viewed as "uncommanded" in the traditional sense because the leader must delegate most of his command responsibilities to subordinates. He must not desire to, and may not be capable of, intervening to regain those responsibilities. The major benefit of this type of command architecture is that it permits subordinate war fighters to take advantage of a common operational picture in order to react rapidly in a fluid battlefield. If NCW technology is simply used to speed the passing and processing of information up and down the chain of command (vice across it), NCW as a concept has failed. Despite the fact that the fundamental nature of command will have to change, this is not readily apparent in all Navy writing or testimony. Naval testimony before congress and in the Naval Transformation Roadmap emphasize "increased speed of command" and delivery of "timely information to decision makers in any environment"[149] The impression created by such statements is that NCW will simply speed the flow of information to the key decision makers. What is not emphasized is that the number of key decision makers will greatly increase and that the decision makers at the top may not make any real time decisions at all. Instead, top leaders will be charged with providing broad guidance and resources to subordinate commanders. On the strategic level this is the role of leader, however what is significant in NCW is that such type of leadership will be pushed to much lower levels. If Navy culture does not embrace a fundamental shift in command responsibilities and expectations, NCW will only represent an evolutionary increase in capabilities and not the revolutionary change promised by the most vocal visionaries.

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[148] Navy Warfare Development Command, "Gaining the Information and Knowledge Advantage: Executive Summary," available from http://www.nwdc.navy.mil/Concepts/IKA/IKA.aspx; Internet; accessed 09 March 2004.

[149] United States Navy, *Naval Transformation Roadmap*, p. 5 of 44; Congress, House, Armed Services Committee, *Statement of Rear Admiral Jay M. Cohen, United States Navy Chief of Naval Research*: Hearing before the Subcommittee on Military Research and Development of the House Armed Services Committee on Navy Transformation, 107th Cong., 20 February 2002; available from http://www.house.gov/hasc/openingstatementsandpressreleases/107thcongress/2002.html; Internet; accessed 24 February 2004.

Intertwined with traditional Navy command relationships is the concept of accountability. Accountability not only demands that people be held accountable for their actions, but it also drives the information cycle. In Network Centric Warfare, speed is of the essence and this is manifested by the concept of posting items before they are processed. Unprocessed or incomplete information is acceptable as the NCW concept assumes that other organizations will be able to process it and fill in gaps. Traditionally within the Surface Warfare community, however, documents and information are thoroughly staffed and often personally approved by the commanding officer before they are permitted to leave the ship, to include posting them on websites. A major reason for this level of control over information flow is that people and commands are held accountable for the quality of their products and because such off ship transmissions reflect upon the command. In a NCW world, however, ships will have neither the manning nor the time to process fully information as they have done in the past. Even if ships did have the resources to process information, such processing would be undesirable because it would slow down the flow of information. Accountability and command will not be eliminated, but they will fundamentally change in the age of Network Centric Warfare. Commanders will have to learn to provide guidance and accept the decisions of their subordinates. Accountability will have to place greater emphasis on speed and relevance and less on completeness, presentation (i.e. how polished and how pretty the product is) and format.

Ideologically, Navy surface culture revolves around control and stability. The mechanical and linear Newtonian outlook of the Navy surface community yields a cultural outlook that views the world around them as predictable and able to be controlled. A warship is a completely self-contained environment where control is essential to survival. Control, however, is not limited to survival. Control extends to the ability to handle a wide range of contingencies, from cleaning, painting the ship, effecting routine repairs to sustaining major damage in battle. Ships are organized with mechanical and manning redundancy to allow commanders to exercise control over the world around them. This Newtonian world desires stability as it indicates control is being

maintained. The only lack of stability that is acceptable is that which is the predictable result of actions taken by operators. This attitude contributes to the conservative nature of Navy culture.

The problem with this ideology of control and stability is that NCW strips away control from individual commanders, particularly at the shipboard level. Information management decisions and actions take place at the "edge" vice top of an organization. Shipboard manning and capabilities have been eliminated on the assumption that seamless connectivity will permit those functions previously accomplished on ship to be completed off ship. The problem is that there are many functions that are not capable of being completed off ship such as painting the sides, repairing of machinery and manning of spaces. Merchant ships operate with such lack of organic control on a daily basis, however this lack of control runs counter to a surface culture that views control of all aspects of shipboard operation as being critical.

The ability of a commander to maintain control and manage his ship is seen as a critical measure of command fitness. Visible or measurable indications of control such as equipment status (CASREPS), cleanliness, topside preservation, accidents and retention are all measures of effectiveness used by superiors to judge the status of a command. This emphasis upon the need of a commander to keep up external appearances is embodied in the saying that "Work it may, shine it must." Commanders will have to accept not being in complete control and the consequences this creates. Included among these consequences are that repairs will be deferred until pulling into port, fluid leaks from piping go unnoticed for hours because spaces are not manned and the sides of the ship may have running rust. All three situations are unthinkable in current surface culture, but are the potential cost of doing business in an NCW world. If leaders do not come to accept the possibilities of such situations, two potential reactions are possible onboard surface ships. First, commanders could attempt to compensate for the smaller crews by overworking them, leading to degraded performance and morale problems. Second, commanders could attempt to cover up negative incidents, leading to a catastrophic breakdown of NCW. In short, NCW is predicated upon relinquishing many elements of control, a concept that is an

anathema to Navy surface culture. Failure to acknowledge this loss of control could at best result in reduced efficiency in a NCW environment and at worse result in a complete failure to leverage the benefits of Network Centric Warfare.

Culture is rooted in the past. It is the product of where an organization has been. Culture is largely composed of things that have served an organization well, and thus become institutionalized as beneficial to that organization. Culture is a complex mixture of the technology, sociology and ideology of a group and a change in one affects the others. There is a saying at the United States Naval Academy that "time, tide and formation wait for no man." The same can be said of technology. New technology is continually being installed on ships with little if any regard for the culture that leaders are attempting to merge this new technology into. Technology does not operate in a vacuum, but it largely depends upon the culture within which it will be used. It is impossible to delay the introduction of technology while waiting for culture to catch up, for the technology itself is a major driver of culture. What is possible for leaders, however, is to have an acute understanding of one's own culture and to consider its potential impact upon the integration of new technology.

During the Second World War, radar was hastily installed on Navy surface combatants and those ships went off to war with little critical assessment of how their culture might react to or influence the use of this new technology. As a result, Navy ships and commanders blindly relied upon existing cultural and tactical norms, resulting in severe losses in the waters around Guadalcanal. The Navy is currently undergoing a technological transformation as C2 systems are upgraded to permit the nearly instantaneous exchange of vast quantities of information. The problem with this rush towards ForceNet or Network Centric Warfare is that its success depends upon much more than equipment on ships and airplanes. To be leveraged to its fullest potential, Network Centric Warfare will necessitate significant shifts in Navy culture. These changes will not come overnight and will inevitably cause much consternation among leaders within the Surface Warfare community, but they are necessary if NCW is to live up to its fullest potential.

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