STRATEGY RESEARCH PROJECT

The views expressed in this paper are those of the author and do not necessarily reflect the views of the Department of Defense or any of its agencies. This document may not be released for open publication until it has been cleared by the appropriate military service or government agency.

THE FUTURE OF MARINE CORPS COMMAND AND CONTROL

BY

LIEUTENANT COLONEL STEVEN ELKINS
United States Marine Corps

19980522 019

DISTRIBUTION STATEMENT A:
Approved for Public Release.
Distribution in Unlimited.

USAWC CLASS OF 1998

U.S. ARMY WAR COLLEGE, CARLISLE BARRACKS, PA 17013-5050

DTIC QUALITY INSPECTED 3

USAWC STRATEGY RESEARCH PROJECT

The Future of Marine Corps Command and Control

by

LtCol Steven Elkins

Capt John Dailey
Project Advisor

The views expressed in this paper are those of the author and do not necessarily reflect the views of the Department of Defense or any of its agencies. This document may not be released for open publication until it has been cleared by the appropriate military service or government agency.

U.S. Army War College
CARLISLE BARRACKS, PENNSYLVANIA 17013

DISTRIBUTION STATEMENT A:
Approved for public release.
Distribution is unlimited.

DTIC QUALITY INSPECTED 3

ABSTRACT

AUTHOR: LtCol Steven Elkins

TITLE: The Future of Marine Corps Command and Control

FORMAT: Strategy Research Project

DATE: 16 March 1998 PAGES: 36 CLASSIFICATION: Unclassified

The Marine Corps is developing a new command and control (C2) system in support of their newly emerging warfighting doctrine, "Operational Maneuver from the Sea" (OMFTS). The OMFTS environment differs from the traditional amphibious operational concept in its fast tempo operations that exploit enemy vulnerabilities via direct movement of forces from ship to shore. A new C2 philosophy that embraces mission type orders, commanders intent, and information technology are critical to the quick and exploitive nature of OMFTS. Full potential of the new C2 system will be achieved through a balanced approach that considers the four C2 system elements: people, doctrine, training, and hardware/software/facilities. These elements are discussed and recommendations are made as how best the Corps may proceed in the development of a new C2 system.

TABLE OF CONTENTS

ABSTRACT iii

THE FUTURE OF MARINE CORPS COMMAND AND CONTROL 1

COMMAND AND CONTROL BACKGROND 3

COMMAND AND CONTROL CHALLENGES AND RECOMMENDATIONS 5

PEOPLE 5

Challenges 5

Recommendations 9

DOCTRINE 11

Challenges 11

Recommendations 14

TRAINING 15

Challenges 15

Recommendations 17

HARDWARE, SOFTWARE, AND FACILITIES 18

Challenges 19

Recommendations 21

CONCLUSION 22

ENDNOTES 27

BIBLIOGRAPHY 29

THE FUTURE OF MARINE CORPS COMMAND AND CONTROL

The Marine Corps command and control (C2) system is undergoing great change in preparation for the Corps' new amphibious concept, Operational Maneuver from the Sea (OMFTS). Increasingly, the security of the U.S. is tied to a global economic community that is predominantly located in the littoral regions of the world. Threats to the global economy are in turn threats to U.S. security. OMFTS answers the call for a full spectrum of military power projection capability for the security of U. S. interests in the littorals. The purpose of this paper is to discuss and recommend changes to the Corps' C2 system that are essential to the success of OMFTS.

The Corps' concept of OMFTS is a future Naval Service - Navy and Marine Corps - capability derived from the naval strategic concept articulated in the doctrinal publications, ...From the Sea and Forward....From the Sea. Doctrine articulated in these publications shifts naval operational focus from blue water operations to power projection and the employment of naval forces from the sea to influence events in the littoral areas of the world. Littoral areas are those regions adjacent to the oceans and seas that are within direct control of and vulnerable to the striking power of sea-based forces.[1] The littoral area is home to three-quarters of the world's population, locations for over

80 percent of the world's capital cities, and nearly all of the market places for international trade.[2] Today, more than 30 percent of the U.S. economy is dependent on foreign markets, predominantly in littoral regions, this percentage is forecast to increase exponentially through the year 2020.[3]

OMFTS defines the manner in which Marines will operate in the littoral regions while executing missions ranging from humanitarian relief to high-intensity conflict. OMFTS differs from traditional amphibious operations in its direct movement of Marines to the objective area, via maneuver from the sea, with no operational pause at the shore line. What distinguishes OMFTS from other kinds of amphibious/ground operational maneuver is the extensive use of the sea as a means of gaining advantage, an avenue of friendly movement that is simultaneously a barrier to the enemy and a means of avoiding disadvantageous engagements.[4] OMFTS characteristics of a decentralized battlefield, fast tempo operations from over the horizon, and simultaneous engagements up to 350 kilometers inland will make new demands on naval manpower and system capabilities.

C2, often thought of as a single element is actually two separate processes. Subtle in their differences, command is the authority and responsibility to give direction to and be responsible for the actions of others. Control is the ability to influence the outcome of individual or group actions. In the military, command and then control go together as hand and glove. Unique to the military is command and then control of large numbers of people possibly displaced over great distances,

sometimes requiring near instantaneous decisions with life or death consequences. Should we forget that command and then control are two very different functions we lose the real meaning of C2 as a military function. When discussing C2 we are addressing a process that includes the separate elements of both command and control. The C2 process is the foundation, the very bedrock, on which all success for OMFTS depends.

COMMAND AND CONTROL BACKGROND

C2 depends on the complex interrelationship of four elements: people, doctrine, training, and computer hardware/software (HW/SW) to include facilities that make up the C2 system. The C2 system allows for the continuous cycle of information whereby the commander directs forces, receives information back from the force, and then makes adjustments to the forces until mission accomplishment.[5]

The Marine Corps is investing now in plans and programs that will ensure the C2 functionality required of tomorrow's Corps. Even though information technology (IT) is the enabling factor for the C2 revolution, people will always be the dominant factor of the system. The people of the Corps have a rich history of innovation to include: the precise utilization of naval gunfire in support of landing forces, amphibious doctrine, bombing in close support of ground forces, tactical employment of helicopters in the ship-to-shore movement, all-weather close air support, and expeditionary airfields.[6] Marines will continue to

be innovators, they will develop and incorporate new C2 doctrine, new training standards, and utilize new HW/SW technologies that will change C2 as we know it today.

C2 in essence is about making and acting on decisions faster than the opposition. This process can be described via a model called the, observation-orientation-decision-action (OODA) loop. The OODA loop describes how when engaged in conflict, we first observe the situation. After observing the situation we orient to it - we make certain estimates, assumptions, analysis, and judgments. Based on this orientation we decide what to do. Finally the decision is put into action.[7] This decision process, basic to all confrontation, may look simple, but as is often the case "the devil is in the details".

Human conflict always has and always will incorporate, in some form and to varying degrees, the element of C2. It is not the intent of this paper to over sell future C2 capabilities, but to reflect on its role in the Marine Corps of the future. As stated by LtGen Van Riper, "Warfare is more than systems; it is fundamentally and ineluctably an interactive contest of human wills. Information superiority, as an enabling element in a command and control system that includes the appropriate doctrine and professional education, is vital. But information superiority in and of itself will not win any wars".[8]

COMMAND AND CONTROL CHALLENGES AND RECOMMENDATIONS

PEOPLE

Of the four C2 elements (people, doctrine, training, and HW/SW/ facilities) the people element is upper most. The Corps' C2 system must be designed and constructed foremost with this element in mind. Specially selected and trained Marines (those with the aptitude and interest) will have to be designated to operate the new system. These people will have to be capable of designing, establishing, and operating the C2 system for an infinite variety of operational configurations.

Challenges

Future C2 requirements will be much more demanding on the "people" element of the C2 system equation. It is a fallacy to believe that current information systems management and communications personnel will have the available time or training to plan, set up, and operate future C2 systems. The Corps is half way to its answer in this "the people element" of the C2 system. The Marine Corps aviation combat element (ACE), unlike the ground combat element (GCE), uses special trained personnel to plan, coordinate, and operate the aviation command and control system. This system the Marine Air Command and Control System (MACCS) has been in existence for decades and provides a seamless

ground/air capability to the Corps that is unique among military services.

The MACCS is an air C2 system that provides the ACE commander the means to command, coordinate, and control all aircraft operations, anti-aircraft missiles, and remotely piloted vehicles within an assigned sector. It also allows the ACE commander to coordinate air operations with other services. The MACCS is made up of six separate commands consisting of airborne and ground based C2 agencies, communications, sensors, and an air defense command. Command of the MACCS is the responsibility of a single commander who oversees coordination of the six subordinate commands. Personnel and equipment that support the MACCS reside in the Marine Air Control Group (MACG) of the Marine Aircraft Wing.[9] Marines, officer and enlisted, of the MACG are trained in air C2 and conduct those type operations on a daily basis.

The Marine GCE has its own C2 system. However, that system is not organized in a manner similar to that of the ACE. The GCE has no command similar to the MACG of the ACE that functions solely to provide personnel, equipment, and a command structure to support the C2 system. Even though, the mission and therefore the C2 requirements of the GCE and ACE are very different, it is time for the GCE to consider the ACE C2 system model.

Another difference in the GCE and the ACE is that the GCE does not formally train, by military occupational specialty (MOS), Marines to plan, coordinate, and operate its C2 system as does the ACE. The GCE assigns secondary duties to Marines from within its own commands for this purpose. The architectural

design and operation of a C2 system is a complex field of study that needs the attention of full time and well trained Marines. The demanding OMFTS environment and the technology of tomorrow's C2 system demands that a new look be taken at how the Corps designates MOSs for the people of its C2 system.

The cost to the Corps for GCE full time C2 personnel will be: people, time, and dollars. Overall, the personnel cost of a GCE C2 MOS will be slight. Consolidation of GCE and ACE C2 personnel made possible by common HW/SW, and IT integration will negate current personnel duplication. Consolidation of GCE and ACE C2 personnel will bring an efficiency to the C2 personnel issue that will result in a decrease in C2 trained Marines the Corps needs. The cost element of "time" includes the period of training required for GCE C2 Marines. The four to five months required for MOS training will be justified in greatly improved operational efficiency. Funding is always an issue. It will cost dollars to establish a GCE C2 MOS school. The dollars associated with the slight increase in the Corps' C2 personnel and training facilities will have to be absorbed through commensurate reductions in other areas.

Common computer HW/SW capabilities will soon allow C2 systems to become integrated throughout the Corps, as well as across service lines. It's time to start bringing down the wall that exists between GCE and ACE C2 personnel. The distinction that exists between the GCE and ACE C2 systems and the resulting split in the two communities will go away in the future for two reasons: 1) common computer HW/SW, 2) fast paced OMFTS operations

that will see a blending, even more than today, of ground and aviation operations. Soon the primary difference between GCE and ACE C2 will be that of operational requirements . The physical differences in HW/SW and command post facilities will be much less than today's unique ground and aviation computer HW/SW and command posts.

The latest IT is being incorporated in the ACE C2 system called Common Aviation Command and Control System (CAC2S). This system will be compatible with two newly developing GCE C2 systems, Combat Operations Center (COC) and Command Center (CC). All three new systems will allow the exchange of information with other U.S. forces. The two new GCE systems will be fielded in 2001, with the ACE to follow in 2002. Defense Information Infrastructure Common Operating Environment (DII COE) is the C2 system guideline these systems must comply with.

The terrain of our C2 world is changing daily, making a paradigm shift in the Corps' leadership necessary. The paradigm shift needed flattens the traditional multi-layered command structure. Ultimately the new command structure will allow for quicker information exchange. During conflict, the side that gains and processes useful information the fastest has the upper hand. It's all about gaining advantage by getting inside the opponent's OODA loop. The Corps must prepare now to take advantage of the greater flow of information made available by IT.

Organizations can be defined by their number of echelons of command. An organization with several layers of command (i.e.

echelons) can be called a "deep" organization and is characterized by a narrow span of control at each layer of command. The more layers of command an organization has, the longer it takes information to flow from top to bottom. Consequently, a "deep " organization tends to be sluggish and less responsive. On the other hand, a "flattened" organization has few layers of command and is characterized by a wide span of control at each layer of command. Speeding up the flow of information will necessitate "flattening" an organization, and thereby widening the span of control of the commander at each echelon.[10]

It is essential that the new C2 organization be flexible to change and to mission requirements. Change is and will continue to be ongoing and fast-paced in the IT world. This change will have to be recognized, and harnessed for American military forces to continue to maintain preeminence on the battlefield. If care is taken now in refining the Corps' C2 organization, future costly restarts can be avoided.

Recommendations

Change to the "people" element of the Corps' C2 system is recommended in three areas: 1) establishment of a C2 MOS for officer and enlisted Marines, 2) the dissolution of the distinction that exists between GCE and ACE C2 personnel, and 3) refine the organization of the people of the C2 system into a more "flattened" vice "deep" organizational structure.

First is the need for the establishment of a C2 MOS for Marines that are responsible for the design, establishment, and operation of the future C2 system. This program should start now. The future C2 system will have great potential; it will be capable of supporting the commander with C2 that far exceeds today's standards. Currently the GCE tasks information systems and communications personnel with C2 responsibilities as an additional duty, resulting in inefficiency. OMFTS depends on a C2 system that incorporates the best that information technology can provide, the Corps must realize its need for C2 specialists trained in the capabilities of the latest IT.

Next, is the need to break down the barriers that exist between the GCE and ACE C2 communities. Standardization of computer HW/SW will allow integration of Marine as well as DoD information systems, bringing common C2 systems to both the GCE and ACE. A common set of HW/SW that differs only in the functions, programmed by the operator, will allow for a common training base that is not possible today. A single pool of C2 MOS trained Marines will be all that is needed to operate either GCE or ACE C2 systems.

Finally, restructuring the C2 hierarchy is the only way the Corps' can fully take advantage of emerging C2 capabilities. The full benefits of IT in the C2 arena will not be felt if information is forced through numerous echelons of the chain of command. New C2 capabilities will allow for a "flattened" C2 organization, speeding the flow of information by putting the decision maker closer to the point of action.

DOCTRINE

Marine Corps C2 doctrine is in the midst of a fundamental change in philosophy. OMFTS demands and IT allows for new concepts and methods of conducting C2 that will require a very real shift in the way of thinking about and conducting amphibious operations. Webster's Seventh New Collegiate Dictionary defines doctrine as, "something that is taught, or a principle or position or the body of principles in a branch of knowledge or system of beliefs".[11] If we prescribe to Webster's definition, the Corps is well on its way to C2 doctrinal change with the October 1996 publication of Marine Corps Doctrinal Publication (MCDP) 6 entitled Command and Control. The new doctrine describes how the Corps will reach effective military decisions and implement military actions faster than an opponent in any environment on any scale from humanitarian operations to war.[12]

Challenges

The Corps' warfighting manual entitled Maneuver Warfare describes the direction of new C2 doctrine. This manual describes maneuver in terms of distance and time, with the objective of moving forces quickly to points of enemy vulnerability. Enemy lines are penetrated disrupting the enemy system from within causing chaos and confusion. The intent is to shatter the enemy's moral, mental, and physical cohesion. Once

done, his ability to fight as an effective and coordinated whole is lost. Even if an outmaneuvered force continues to fight, he is easily defeated because his ability to fight as a force has been eliminated.[13] As Sun Tzu said, "Now an army may be likened to water, for just as flowing water avoids the heights and hastens to the lowlands, so an army avoids strengths and strikes weakness".[14]

As stated in the Marine Corps Concept Paper Operational Maneuver from the Sea, "The heart of OMFTS is the maneuver of naval forces at the operational level, a bold bid for victory that aims at exploiting a significant enemy weakness in order to deal a decisive blow."[15] Clearly, a new C2 system will have to have the fluidity to serve the Corps' doctrinal requirements whether they be the more traditional Marine Corps operations or OMFTS. Also, the doctrine has to apply across the spectrum from peace time operations to war.

The Corps establishes a dramatic institutional change with its new doctrine. No longer will the planning method of C2 dominate, the new doctrine establishes the mission method of C2 as preferred. The planning method of C2, the military's normally accepted method of C2, trades flexibility and the exploitation of the time element for comprehensiveness. The planning method of C2 is characterized by a highly centralized planning process that attempts to plan every move in advance, relying on people, training, and equipment to carry out the plan as ordered. This process attempts to script conflict (e.g. highly detailed operations plans and orders, or long lead time and inflexible air

tasking orders). All efforts are made to reduce information requirements by focusing on centers of gravity and target lists. Command by planning fights to put some order into the inherently disorder of warfare.[16]

The Corps' new doctrine of mission C2 emphasizes flexibility and rapid decision making over the planning method's precision control. The mission method of C2 is an essential element of the fast tempo operations and quick exploitation of enemy vulnerabilities. As can be seen, mission C2 is as much a new procedural process as it is a new way of thinking. As noted by Gen Patton, "a good plan violently executed now is better than a perfect plan executed next week."[17]

Mission C2 relies on commanders assigning and explaining the intent of missions to subordinates, but leaving the subordinates as free as possible to accomplish the details of the mission. The commander issues broad guidance rather than detailed directions.[18] Mission C2 is dependent on: highly trained personnel, initiative at lower echelons, and the commander's ability to establish a common vision through his stated intent. It should be noted that the Corps' C2 doctrine does not propose mission type C2 for all cases, but does emphasize mission C2 when the situation allows.

The function of command, as described by Martin Van Creveld in his book Command in War, can be carried out by one or any combination of the three methods. Two have been discussed, the planning method and mission C2. The third method, direction C2 focuses on the commander's attempt to direct all the forces all

the time. The U.S. Army's concept for its "Army After Next" relies heavily on the direction method of C2. This method relies on battlefield information dominance. The Army foresees information dominance as allowing the commander to apply discrete parts of his force in a single simultaneous act of overwhelming fire and maneuver.[19] The commander who is able to observe every enemy movement is able to divide his forces and position each precisely enough to control and dominate the enemy.[20] Obviously, the Army is depending a great deal on IT as the enabler of its future force.

Recommendations

The Marine Corps must pursue the mission method of C2 for most of its operations. There will be missions where direct or planning C2 or a combination of the three is more appropriate. The Corps has taken the first step toward its future C2 system with a doctrinal change in command philosophy that emphasizes mission C2. However, the direct method of C2 deserves more consideration by the Corps than it receives. Future IT advancements will enable the direct C2 method to be of more benefit than the Corps seems to be anticipating.

IT is rapidly changing our world, it is important that we use that technology to our greatest advantage. The future will never bring us the information capabilities that will enable a commander to have the situational awareness required to direct all of his forces all the time. However, the near future will

see IT advancements that will greatly improve the direct method of C2. The Corps would do well to take a much stronger stance in incorporating the direct method of C2 along with its position on mission C2.

TRAINING

As the Corps' C2 doctrine changes, so must its training. Training must clearly focus on the future maneuver warfare environment and the mission method of C2. Training must also emphasize the capabilities presented by IT. Training is the essential part of C2 that ties all the individual elements of people, doctrine, and HW/SW and facilities together and allows them to operate as a system. Proper training will prepare people for their place in the C2 system.

Challenges

As the Corps prepares for the future OMFTS environment, its C2 doctrine has to change to meet new demands. Training must follow the path of the new C2 doctrine. To get a feel for the C2 training challenge facing the Corps, one only has to look at how their doctrine has changed over the last five years. The Corps' C2 doctrine as established in Fleet Marine Force Manual (FMFM) 3, titled Command and Control, in effect from June 1993 to October 1996, is a very different philosophy than that described in the latest C2 doctrine of MCDP 6.

FMFM 3 doctrine was more of a direction and planning philosophy of C2 than is MCDP 6. FMFM 3 primarily reflected the traditional concept of C2 whereby the commander and his staff conduct the planning process, issue orders, and oversee the conduct of operations. Mission C2 is clearly down played. The following passage from FMFM 3 expresses the philosophy of that document. "The commander's mind is the focus of Marine command and control. Through the extension of control, the commander's influence becomes the focus of the total command and control infrastructure and forms the fundamental conduit of command authority."[21] MCDP 6 focuses much less on the commander's ability to control and more so on his ability to express "commander's intent" and the decision making ability of lower echelon commanders.

Clearly, the training methods required by the two doctrines are very different. The training emphasis of FMFM 3's doctrine, of directive and planning C2, leaned heavily toward studying the organizational hierarchy, command responsibilities, and electronic linkages between units that make up the C2 network. The training emphasis of MCDP 6's mission method of C2 leans heavily toward fostering initiative and improving decision making skills at all levels of the chain of command. Both publications discuss the importance of the entire C2 structure, the difference being what they emphasize.

Recommendations

The Corps' primary method of C2 will be mission oriented however, that does not mean that the direction and planning methods of C2 will not have their place. Training will have to include all three methods with the preponderance of training time devoted toward mission C2. Also, the importance of devoting training time to the organizational make up, responsibilities, and electronic linkages of the C2 structure can not be forgotten.

Of great importance to the Corps' C2 training for the future is a change in mind set. Since mission C2 requires initiative and sound decision making at all echelons, training must foster initiative and improved decision making among all Marines. In the new training environment the Corps must allow mistakes of action but not inaction.[22]

Training exercises to include: field exercises, computer simulations, tactical decision games, command post exercises, and others must include the C2 issues that are all too often simulated or worse yet not even considered. C2 has to become a vital part of all training exercises. Mission C2, because of its free flowing and fast tempo operations, depends on all members of the system knowing their function within the organization and being able to carry out their command requirements without close oversight.

Finally, the Corps must recognize and train their C2 specialists as they do any other occupational specialty (e.g. infantry, artillery, etc). C2 will be taking an even more

prominent position on future battlefields, maneuver warfare demands it and IT allows for it. This subject has been discussed in the people section of this paper, but it also falls in the training element on the C2 system. The subject of recognizing and training the Corps' C2 people as a team may well be one of the most important issues facing the future C2 system of the Marine Corps.

HARDWARE, SOFTWARE, AND FACILITIES

HW/SW advancements will enhance the planning and conduct of operations, reducing time lines from days to hours. Geographically distant commanders will be able to collaborate via video teleconferencing and have access to the latest information and automated planning tools. Video teleconferencing and e-mail will replace the automated digital information network. Leaders throughout the chain of command will have easier and quicker access to mission-critical intelligence, logistics, and weather information, enhancing the decision making process.[23]

Military engagements are marked by uncertainty and quick decision-to-action cycles. This all goes back to the previously discussed OODA loop. Information on which to make decisions will never be as complete as the commander desires, but the speed with which it can be gathered, processed, and acted on is the critical factor. HW/SW technology will allow the OODA loop to be reduced if all elements of the C2 system are supportive of each other.

Facilities that house the HW/SW and people of the C2 system is an issue the Corps has to come to grips with. Common type facilities do not exist in the Marine Corps. The different ground and aviation commands piece together in various configurations their own combat operations centers (COC) in anything from tents to rigid walled shelters. Much time and energy is spent in the configuring anew of COCs for each deployment.

Challenges

Maintaining current IT is difficult due to the time consuming nature of the military's acquisition process. There are certainly good reasons for the step by step method of the acquisition process. However, it must become more flexible if the military is to gain and maintain any kind of advanced IT capability. As Gordon Moore, cofounder of Intel corporation, predicted in 1965, the capacity of a computer chip will double every year. His predictions stood for ten years, then he amended it predicting a doubling of capacity every two years. Moore's Law holds true to this day.[24] With an acquisition process that takes an average of twelve years to get a system from inception to the user, it is possible that the military will always be at least a decade behind current technology.

A great deal of work is being done in the area of acquisition reform, to shorten the process. Many reforms are needed, one of the most promising being open architecture

processing. The military should not allow itself to be trapped in a proprietary situation, where the rights to change/upgrade systems are owned by a particular company. Care must be taken in contract development, system development, and funding for proprietary rights of design data, which will reduce HW/SW upgrade costs down stream.

Another area that deserves study is the concept of leasing versus purchasing. The average life of a weapon system is fifteen to twenty years. With processor speed doubling every two years, how will the military ever present a real cutting edge IT threat to anyone? With a twelve year acquisition cycle and a fifteen to twenty year in service period, military systems can easily be one or even more decades behind current technology by the time they are taken out of service. Leasing may be the answer to maintaining current IT viability. Leasing would ensure the military access to the latest IT, due to frequent turnover in leasing contracts.

The practical problem of replacing the physical structures of the C2 system is often over looked. The Corps needs a highly mobile, light weight, multi-configuration, rigid walled, collapsible shelter system for its C2 assets. Shelter systems exist on the market and are used by other military services and civilian organizations that will perfectly satisfy Marine Corps requirements. Sometimes the effort to overcome the inertia of doing nothing plus the effort required in dealing with the acquisition bureaucracy is almost overwhelming. The shelter

element of the C2 system is the one element of the whole C2 system upgrade process that could be solved now.

Recommendations

The Corps is moving out smartly in many parts of the "HW/SW and facilities" element of the C2 equation. The development of new systems has started and acquisition reform has been initiated. The ACE is farthest along in the development process of the Corps' HW/SW/facility upgrades. The C2 system of the ACE, CAC2S, will deliver complete HW/SW, and facility upgrades. The GCE's new C2 systems, COC and CC, will bring HW/SW and facility modernization and integration to the Marine ground component.

The GCE and ACE C2 programs are vulnerable to fiscal reductions, as are all systems in today's military budget. It is essential that the Corps recognize and protect the capabilities these systems represent. Fiscally these programs are in a good position to benefit from acquisition reform initiatives that are now being developed. Aggressive pursuit of cost savers such as: contract incentive awards, commercial standards vice military specifications, commercial and government off-the-shelf procurement, commercial maintenance support, and leasing agreements to name a few will go a long way toward cutting costs and getting these systems to the field as quickly as possible.

The Corps is in danger of losing some of the personnel and fiscal economies that present themselves during this early development period. The integration of HW/SW and facilities for

the GCE and ACE must be closely coordinated. The acquisition system's requirements documents, and program baselines are developed by two different organizational divisions. It is recommended that close coordination of the two divisions be conducted in order that integration aspects can be fully realized.

HW/SW and facilities are the final essential element of the Corps' newly emerging C2 system. The fact that this element depends upon the latest technology in a discipline that sees constant advancement makes it especially challenging. As this piece of the C2 system is developed it must be designed with forethought to flexibility and expectation of near continuous change.

CONCLUSION

The Marine Corps' future operational concept of OMFTS will be supported by a newly emerging C2 system that will revolutionize the Corps' operations. The new C2 system has the potential for being more than an important support system to the overall operational effort. It can become a force enabler that will allow the employment of military power as never before. The new C2 system will be challenged in its support of the OMFTS environment that includes: direct movement of forces from ship to objective, decentralized, fast tempo, flexible, and simultaneous engagements up to 350 kilometers inland. Never before has the Corps asked for, nor depended so heavily on its C2 system. The

Corps is dependent on this system to enable its OMFTS operating concept of the future.

As the new system is developed it is vital to realize that C2 truly is a system of interdependent elements. The elements can be likened to a mathematical problem whereby an error in adding individual elements will result in an incorrect final product. The C2 equation is: people + doctrine + training + HW/SW and facilities = C2 system.

The unique element of the C2 system is and always will be the "people" element. The greatest care must be taken with this element of the system as C2 advances into the future. The Corps would do well to rethink how it uses and organizes the people that make up the foundation of its C2 system. Newly emerging common HW/SW will allow the Corps' two C2 communities that support the GCE and ACE to be combined into a single community supporting the Corps as a whole. It is also important that an MOS for C2 personnel be developed.

Doctrine is the element in the C2 system that establishes over-arching principles, it is the map to the C2 terrain. A newly published doctrine establishes the basic direction the C2 program will take. The recently released C2 manual, MCDP 6, presents a bold shift in doctrine. The mission method of C2 has become the prescribed standard, a far more flexible and useful doctrine in the emerging OMFTS environment.

The training element of the C2 system will be a real challenge to the Corps as they prepare for the future. Establishing change to institutional ideas and ways of doing

things are tough for any organization to make. C2 doctrine has changed and training must follow suit as it prepares Marines for OMFTS requirements. The emphasis has to shift from one that predominantly teaches the directive and planning methods of C2 to one that emphasis the new doctrine of mission C2. Mission C2 facilitates a very fast decision-to-action process. Fast tempo, flexible operations will become the norm for OMFTS as well as other types of Marine Corps operations. For C2 to lead the way, as it must, Marines have to be trained to make good decisions at the lowest echelons. Initiative has to be encouraged, and mistakes allowed. This training must start with a different mind set on the part of the Corps' leadership. Fast paced operations will only be achievable if lower level leaders are allowed to make command decisions.

The HW/SW and facility element of the C2 system is a bit different from the other three elements. The fact that we, as a nation, are moving into the information era causes this element to be full of exciting possibilities and at the same time often caught up in its own hyperbole.

Computer HW/SW advancements are going to change the face of future C2. Soon commanders will be able to collaborate on a regular basis in real time via video teleconference, e-mail, and have access to common data bases and up to date intelligence information. These and other decision aids will become common place expectations on the future battlefield. Care must be taken in not over burdening the system with information of little importance to the commander. The Corps must stay focused on what

C2 is all about. Care must be taken not to become overly dependent on IT, for it will never replace battlefield confrontation.

The IT, that makes our HW/SW advancements possible, is moving forward at such a rate that it will be difficult to stay near the forward edge of current technology. Initiatives are proceeding that will streamline the acquisition process and get weapon and HW/SW systems to the user in a more timely manner. The difficulties of maintaining currency in IT may well be the most challenging aspect of the Corps' new C2 system.

Advancements in C2 are essential to the success of the Corps' new OMFTS concept. OMFTS describes the best way to deal with future threats to U.S. security. Advancements in technology have allowed global trade and interdependence among countries to reach unprecedented heights. The answer to maintaining these global ties and keeping world economies in check lies in quick-paced operations from the sea. The nature of conflict has already changed. Now C2 must follow suit.

WORD COUNT 5914

ENDNOTES

[1] Department of the Navy, ... From The Sea, Navy and Marine Corps White Paper (Washington, D.C.: U.S. Department of the Navy, September 1992), 3-11.

[2] Marine Corps Concept Paper, Operational Maneuver From The Sea, "Chaos In The Littorals"; available from <http//ismo-wwwl.usmc.mil/concepts/omfts.htm>; Internet; accessed 6 December 1997.

[3] Charles C. Krulak, "Operational Maneuver From The Sea," Proceedings (January 1997); 26.

[4] Ibid., 28.

[5] Department of the Navy, Command and Control, Marine Corps Doctrinal Publication 6 (Washington, D.C.: U.S. Department of the Navy, 4 October 1996), 40-52.

[6] Victor H. Krulak, First To Fight (New York, NY: Pocket Books, 1991), 82-83.

[7] Command and Control, Marine Corps Doctrinal Publication 6, 63.

[8] Paul K. Van Riper, "Information Superiority," Marine Corps Gazette (June 1997): 57.

[9] Department of the Navy, Control of Aircraft and Missiles, Fleet Marine Force Manual 5-60 (Washington, D.C.: U.S. Department of the Navy, 22 June 1993), 2-1.

[10] Command and Control, Marine Corps Doctrinal Publication 6, 87-93.

[11] Webster, Seventh New Collegiate Dictionary, 18th ed. (Springfield, MA: G&C Merriam Company, 1970) 246.

[12] Command and Control, Marine Corps Doctrinal Publication 6, forward.

[13] Department of the Navy, Warfighting, Marine Corps Doctrinal Publication 1 (Washington, D.C.: U.S. Department of the Navy, 20 June 1997), 72-73.

[14] Sun Tzu, The Art of War, (New York, NY: Oxford University Press, 1971), 101.

[15] Department of the Navy, Operational Maneuver from the Sea, Marine Corps Concept Paper (Washington D.C.: U.S. Department of the Navy, 4 January 1996), 10.

[16] Thomas J. Czerwinski, "Command and Control at the Crossroads," Marine Corps Gazette (October 1995): 14.

[17] Command and Control, Marine Corps Doctrinal Publication 6, 116.

[18] Ibid., 109.

[19] Department of the Army, Knowledge and Speed, The Annual Report of the Army After Next Project (Washington, D.C.: U.S. Department of the Army, July 1997), 13.

[20] Ibid., A-5 and A-6.

[21] Department of the Navy, Command and Control, Fleet Marine Force Manual 3 (Washington, D.C.: U.S. Department of the Navy, 16 June 1993), 11.

[22] Command and Control, Marine Corps Doctrinal Publication 6, 130.

[23] Arthur K. Cebrowski and John J. Garstka, "Network-Centric Warfare Its Origin and Future," Proceedings (January 1993): 37.

[24] Bill Gates, The Road Ahead (New York, NY: Viking Penguin, 1995), 31.

BIBLIOGRAPHY

1. Boorda, J.M. "Fighting Smarter: A Naval Tradition." Marine Corps Gazette (December 1995): 18-20.

2. Cebrowski, Arthur K. and Garstka, John J. "Network-centric Warfare Its Origin and Future." Proceedings (January 1998): 28-38.

3. Czerwinski, Thomas J. "Command and Control at the Crossroads." Marine Corps Gazette (October 1995): 13-15.

4. Gates, Bill. The Road Ahead. New York, NY: Viking Penguin, 1995.

5. Jurcheck, John. "Visualizing the Littoral Battlespace." Surface Warfare (July/August 1997): 10-15.

6. Krulak, Charles C. "Operational Maneuver From The Sea." Proceedings (January 1997): 26-31.

7. Krulak, Victor H. First To Fight. New York, NY: Pocket Books, 1991.

8. Operational Maneuver From The Sea, "Chaos In The Littorals". Available from <http//ismo-wwwl.mqg.usmc.mil/concepts/omfts.htm>. Internet. Accessed 6 December 1997.

9. Tzu, Sun. The Art of War. New York, NY: Oxford University Press, 1971.

10. U.S. Department of the Army. Knowledge and Speed. The Annual Report on The Army After Next Project. Washington, D.C.: U.S. Department of the Army, July 1997.

11. U.S. Department of the Navy. Command and Control. Fleet Marine Force Manual 3. Washington, D.C.: U.S. Department of the Navy, 16 June 1993.

12. U.S. Department of the Navy. Command and Control. Marine Corps Doctrinal Publication 6. Washington, D.C.: U.S. Department of the Navy, 4 October 1996.

13. U.S. Department of the Navy. Control of Aircraft and Missiles. Fleet Marine Force Manual 5-60. Washington, D.C.: U.S. Department of the Navy, 22 June 1993.

14. U.S. Department of the Navy. ....From The Sea. Navy and Marine Corps White Paper. Washington, D.C.: U.S. Department of the Navy, September 1992.

15. U. S. Department of the Navy. Operational Maneuver from the Sea. Marine Corps Concept Paper. Washington, D.C.: U.S. Department of the Navy, 4 January 1996.

16. U.S. Department of the Navy. Warfighting. Marine Corps Doctrinal Publication 1. Washington, D.C.: U.S. Department of the Navy, 20 June 1997.

17. Van Riper, Paul K. "Information Superiority." Marine Corps Gazette (June 1997): 54-62.

18. Van Riper, Paul and Scales, Robert H. "Preparing for War in the 21st Century," Parameters 27 (Autumn 1997): 4-14.

19. Webster. Seventh New Collegiate Dictionary, 18th ed. Springfield, MA: G&C Merriam Company, 1970.