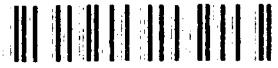


(2)

STUDY PROJECT

MARINE CORPS AVIATION ASSUALT SUPPORT FOR THE 21ST CENTURY: IS THERE A CASE FOR THE MV-22?

BY

Colonel Donald B. Beaver
United States Marine Corps

USAWC CLASS OF 1992

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

Unclassified
SECURITY CLASSIFICATION OF THIS PAGE

REPORT DOCUMENTATION PAGE

Form Approved
OMB No. 0704-0188

1a. REPORT SECURITY CLASSIFICATION Unclassified	1b. RESTRICTIVE MARKINGS N/A
2a. SECURITY CLASSIFICATION AUTHORITY US Army War College	3. DISTRIBUTION / AVAILABILITY OF REPORT Approved for public release. Distribution is unlimited.
2b. DECLASSIFICATION / DOWNGRADING SCHEDULE N/A	
4. PERFORMING ORGANIZATION REPORT NUMBER(S)	5. MONITORING ORGANIZATION REPORT NUMBER(S)
6a. NAME OF PERFORMING ORGANIZATION US Army War College 6b. OFFICE SYMBOL (If applicable)	7a. NAME OF MONITORING ORGANIZATION
6c. ADDRESS (City, State, and ZIP Code) Carlisle Barracks, PA 17013-5050	7b. ADDRESS (City, State, and ZIP Code)
8a. NAME OF FUNDING / SPONSORING ORGANIZATION 8b. OFFICE SYMBOL (If applicable)	9. PROCUREMENT INSTRUMENT IDENTIFICATION NUMBER
8c. ADDRESS (City, State, and ZIP Code)	10. SOURCE OF FUNDING NUMBERS PROGRAM ELEMENT NO. / PROJECT NO. / TASK NO. / WORK UNIT ACCESSION NO.

11. TITLE (Include Security Classification)

Marine Corps Aviation Assault Support for the 21st Century: Is There a Case for the MV-22?

12. PERSONAL AUTHOR(S)
Colonel Donald B. Beaver, USMC

13a. TYPE OF REPORT	13b. TIME COVERED	14. DATE OF REPORT (Year, Month, Day)	15. PAGE COUNT
Individual	FROM N/A TO _____	1992 April 8	28

16. SUPPLEMENTARY NOTATION

17. COSATI CODES			18. SUBJECT TERMS (Continue on reverse if necessary and identify by block number)
FIELD	GROUP	SUB-GROUP	

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

"We've done so much with so little for so long that we now can do anything with nothing." Although the author of the above statement has long been forgotten, Marines have used the quote for so long that we often believe it. With the current international political environment reflecting a reduced threat from the former Soviet Union and a growing trend towards reduced military force levels, whatever force remains must be efficient and very capable. The challenge to the Corps and our sister services is to ensure that as our forces are reduced, we maintain the technological edge and acquire only those equipments that have demonstrated enhanced capabilities. The attached appraisal of our Marine Corps' aviation assault support potential, and what our vision for the twenty-first century is, addresses these critical challenges.

20. DISTRIBUTION / AVAILABILITY OF ABSTRACT ☒ UNCLASSIFIED/UNLIMITED ☐ SAME AS RPT. ☐ DTIC USERS	21. ABSTRACT SECURITY CLASSIFICATION Unclassified
22a. NAME OF RESPONSIBLE INDIVIDUAL COL C. E. Sooy, USMC, DSN 242-4200	22b. TELEPHONE (Include Area Code) (717) 245-4200 22c. OFFICE SYMBOL AWCJ

DD Form 1473, JUN 86 *Previous editions are obsolete.*

USAWC MILITARY STUDIES PROGRAM PAPER

MARINE CORPS AVIATION ASSAULT SUPPORT FOR THE 21ST CENTURY: IS THERE A CASE FOR THE MV-22?

by

Colonel Donald B. Beaver

Colonel Craig Sooy
Project Advisor

US Army War College
Carlisle Barracks, Pennsylvania 17013
8 April 1992

ABSTRACT

AUTHOR: Donald B. Beaver, Col., USMC

TITLE: Marine Corps Aviation Assault Support for the 21st Century: Is There a Role for the MV-22?

FORMAT: Individual Study Project

Date: 8 April 1992 Pages: 28 Classification: Unclassified

"We've done so much with so little for so long that we now can do anything with nothing." Although the author of the above statement has long been forgotten, Marines have used the quote for so long that we often believe it. With the current international political environment reflecting a reduced threat from the former Soviet Union and a growing trend towards reduced military force levels, whatever force remains must be efficient and very capable. The challenge to the Corps and our sister services is to ensure that as our forces are reduced, we maintain the technological edge and acquire only those equipments that have demonstrated enhanced capabilities. The attached appraisal of our Marine Corps' aviation assault support potential, and what our vision for the twenty-first century is, addresses these critical challenges.

INTRODUCTION

The U. S. Navy and Marine Corps team constitutes the most powerful maritime force in the world, and it is facing significant reductions in force imposed by budgetary constraints due in part to a perceived reduction in the strategic global threat.[1] At the same time, the potential for regional instability is forecast to increase world wide in areas where maritime forces have historically been employed in the littorals to help maintain stability and ensure the free movement of commerce over the seas of the world.[2] The need for force structure and doctrinal adjustments to complement our national maritime strategy is obvious. What organic aviation is required to enhance our strategy? What kind and how much is required? How does advanced aircraft technology fit into the equation?[3] All these questions provide a challenge to the visionaries who will shape the aviation of our Corps in the future as they struggle with the Marine Corps' piece of our nation's defense.

To a degree, Marine aviation has been preparing itself for the lean years by reducing the number of aircraft type/model/series and by standing down

squadrons we can no longer afford to sustain. The Corps' current program supports this philosophy through the Future Years Defense Plan (FYDP) and beyond with emphasis on investing in the future. Our iniative could take Marine aviation down to only six, and potentially four, aircraft types by 2015.

As we review the challenges to and capabilities of maritime force projection into the future, it would be prudent to examine existing structure, the systems now being used, and the alternatives that will enhance our ability to influence from the sea. Whatever aircraft and numbers we have must be capable of providing the Marine Air Ground Task Force (MAGTF) Commander with the assets necessary to shape the battlefield and provide a maneuver element that can exploit enemy weaknesses.

CURRENT AVIATION ASSAULT SUPPORT STRUCTURE

The Corps' most pressing challenge is the replacement of, or upgrade of, our existing assault support inventory. The tasks of assault support fall within four categories: (1) vertical assault airlift (2) air delivery (3) inflight refueling, and (4) air evacuation.[4]

The aircraft used to perform these tasks are found in several type squadrons. Our Marine Medium Helicopter Squadrons (HMM) are the primary troop transport squadrons, containing the aging CH-46 helicopter. Marine Heavy Helicopter Squadrons (HMH), equipped with the CH-53D/E helicopter, are responsible for our logistics and heavy lift requirements. The Marine Light Attack Squadrons (HMLA) are composed of the aging UH-1N and the newer AH-1W helicopters. The UH-1N is primarily used for utility support and the AH-1W is tasked primarily for close-in fire support missions. Marine Observation Squadron (VMO) contains the aging OV-10A and the newer D model aircraft. The OV-10A/D is tasked with air reconnaissance, observation, and air control operations, to list a few. Some specific assault missions performed by the OV-10 are air drop, air delivery, illumination, and evacuation. Although the newer OV-10D and D+ are still arriving in our inventory, many would say there is no role for the OV-10D on the modern battlefield. The Marine aerial refueler/transport squadrons (VMGR) fly the KC-130 aircraft. Its primary mission is to provide aerial refueling service to Fleet Marine Force units.

It is often used to augment critical logistical support to wing and division units.

A CH-46 squadron of twelve aircraft has the capability of moving approximately one reinforced infantry company (225-250 Marines) in a single lift.[5] The CH-46 is approaching its twenty-sixth year of service life in 1995, and a long term replacement has not yet been identified.[6] The Marine Corps is seventy aircraft short of its medium lift requirement, due in part to several factors: service life, CH-46 attrition, spare parts, and budget problems with the acquisition of the primary replacement aircraft. The MV-22 Osprey was identified as the Corps' medium lift replacement in the early 80's, but as conventional programs gave way to strategic programs and defense dollars became scarce, the Secretary of Defense placed the program on hold. The original buy of 522 MV-22s was to replace about 250 CH-46s and 130 earlier model CH-53s.[7] To date, the Corps still has a medium lift shortfall, and the aircraft that remain in our CH-46 inventory are quickly approaching the end of their service life.

The AH-1W is the most recent version of the AH-1

to be fielded. It is virtually a new helicopter with the capability for the Hellfire, Sidearm, Sidewinder, and TOW missiles. A few problems will have to be solved before this attack helicopter can achieve its full potential. The Hellfire has a laser receiver installed for terminal guidance, which means the missile must "see" laser energy for it to terminally guide. The AH-1W does not have any laser "designate" capability, thus the successful employment of the Hellfire depends on an independent source of laser designation, e.g. MULE ground designator or OV-10D/A6-E airborne designator. A night targeting system which will have a laser designator is under development for the AH-1W in conjunction with the Israelies. Additionally, the number of AH-1W's available for contigency operations around the world is a mere 102. The MAGTF master plan envisions replacing the AH-1, UH-1, and OV-10 with a common vertical takeoff or land (VTOL)/ short takeoff or land (STOL) aircraft during the first decade of the next century.[8] This aircraft may well be a derivative of the MV-22 if the MV-22 is selected to fill the medium lift void. This, for obvious reasons, would provide an aircraft with

compatible mission and performance profiles to the MV-22.

OUR AGING MEDIUM LIFT FLEET AND ITS FUTURE

Although our assault support fleet is in need of help with virtually every aircraft in some way or another, our most urgent fix, as mentioned previously, is with the medium lift portion of the equation. "Marine Corps aviation, in aggregate, is healthy. However, I cannot overemphasize the seriousness of our medium lift shortfall."[3]

The CH-46 was procured from 1963 through 1971 with the intent to fill a twenty-four year requirement for medium lift in support of the United States Marine Corps. The planned service life has since been converted to flight hours for airworthiness certification purposes, more specifically, for the purpose of determining what fatigue life the aircraft and critical systems must meet. In 1978, the Navy established the service life of the CH-46 as 10,000 hours. The CH-46 fleet is rapidly approaching the 10,000 hour planned service life. One airframe in the Navy has already reached that milestone.

The Marine Corps planned to have the CH-46 out of

the inventory by 1999. The phase out is obviously not going to happen at that time, as the Secretary of Defense has not supported the Corps' choice of the MV-22 to replace the aging CH-46 fleet. The Marine Corps has grown and stretched the service life of the CH-46 as far as we can without affecting safety. We've extended life through one inspection after another as well as a complete safety, reliability, and maintenance program (SR&M). The purpose of this was to reduce the costs of ownership, keep aircraft readiness at a sufficient level so operational capability would not be seriously degraded, and to enhance the safety of the aircraft. The aviation planners looked at the reliability and performance data of 160 items that contributed to the unscheduled maintenance for the CH-46. The top fifty accounted for 92% of the maintenance problems. Thirty-two items became the SR&M program, since the other eighteen were already the subject of an engineering change proposal (ECP) or were already in research and development to correct known problems. The first SR&M aircraft improved CH-46 was finished by the depot at Cherry Point in November 1983. In layman's terms, all that could have been done to extend

the service life of the CH-46 was done without investing in a costly Service Life Extension Program (SLEP).

The cancellation of the Osprey by the Secretary of Defense has the Marine Corps scrambling to solve the medium lift replacement for the CH-46. We basically put our eggs in one basket and now face living with the consequences as best we can in the aftermath of this decision.[10] One proposal is to extend the service life of existing CH-46s through the year 2020 by optimizing safety, cost effectiveness, and operational suitability, utilizing UH-1N's to help offset the CH-46 shortfall.[11]

Current estimates by NAVAIR indicate we will have to SLEP some airframes and procure additional aircraft to make up for attrition of the CH-46 fleet. The Osprey was due to be introduced into the fleet in 1992, and as it came on board the CH-46 aircraft would go out of the USMC inventory. The weapons system manager for the CH-46 believes it would take seven years before the first SLEP hardware implemenation kits could be available. Also 10% of the CH-46 fleet will have reached or exceeded the 10,000 hour service life prior

to the kits being delivered.[12]

The Marine Corps is analyzing a four phase life extension and upgrade for its fleet of CH-46 assault support helicopters as an alternative to the Pentagon's plan to replace the aircraft with a derivative of the UH-60 Black Hawk and buying more CH-53Es. In addition to a renewed CH-46 program, we are considering the Westland/Agusta EH 101, Boeing's Model 360 technology demonstration helicopter. These alternatives, plus the V-22 itself, were analyzed in an independent cost and operational effectiveness analysis prepared for Congress and the Pentagon by the Institute for Defense Analysis. This study was requested by the Secretary of Defense and delivered to the Subcommittee of the Defense Committee on Appropriations on July 19, 1990.[13]

Although Secretary Cheney does not support the V-22 program, he is being forced to keep the program alive until all possible alternatives have been studied and a final decision is made.

A CH-46 program would cost less than a UH-60 Black Hawk derivative which is too costly and too small. The CH-46 carries a Marine squad of 16 - 18, while the UH-

60 is sized to an Army squad of eleven soldiers. A stretched version of the UH-60 to accommodate the larger squad would lead to substantial development costs and take too long.[14] Gen. Gray, former Commandant of the Marine Corps, had this to say about the UH-60:

> "We're going to have to get twice as many helicopters, and we're not going to get that, are we? Nor are we going to get twice as many pilots and twice as many crew chiefs in the kind of environment (budget cut) that we're in today."[15]

Time is running short and the 19 February 1990 issue of Aviation Week Magazine reports the Marines have a plan revolving around the CH-46. In distinct phases, some of them occurring simultaneously, the CH-46 plan entails:

> A service life extension program for most of the current fleet. The emphasis would be on dynamic components, including the rotor system, transmission, and hydraulics.
>
> New production of CH-46's as quickly as possible. These helicopters would be manufactured with improvements already made in fleet aircraft, but otherwise would have the configuration in which the CH-46 was last produced. This phase would be held below 100 aircraft, providing for no more than attrition of the fleet.
>
> Development and production of a CH-46E derivative, being called the CH-46X. The upgrade would include modern equipment developed for other programs, including integrated controls and the V-22 derived glass cockpit incorporated in the

Boeing MH-47E and Sikorsky MH-60K special operations forces helicopter.

Upgrade of all E models in the field into the X configuration. A thorough remanufacturing program would start the new X models off with new lifetimes lasting well into the 2020's.[5]

In the end, we would have approximately 350 CH-46 X's. This plan assumes that current Marine Corps force levels will survive Pentagon budget cutting, realizing aircraft numbers would be reduced as force levels were reduced. We would then have to seek a reallocation of defense dollars to accelerate a reopening of the CH-46E production line at Boeing. Table 1 shows how the CH-46E new production would be configured. Table 2 shows the CH-46X new production configuration. The CH-46X would have to be capable of carrying the tow-configured HMMWV (7900 lb) externally and a crew of three (750 lb) internally out to 50 NM and return with 20 minutes of 10% initial fuel, whichever is greater.[17]

The Pentagon plan would replace plans for the Ospreys with a mix of CH-53E and UH-60 helicopters to meet the Corps' medium and heavy lift needs. A Pentagon cost comparison done in 1989 showed that buying 176 CH-53 and 590 UH-60 helicopters would cost $6 billion more than the Ospreys if produced jointly by Bell-Boeing.[18]

Table 1

NEW PRODUCTION CH-46E CONFIGURATION

CURRENT CH-46E

SLEP UPGRADE

- DYNAMIC COMPONENT UPGRADE

BLOCK UPGRADE

- EXTENDED RANGE STUB WING
- DOPPLER NAVIGATION/GPS
- COCKPIT MANAGEMENT SYSTEM
- HELO EMERGENCY FLOTATION SYSTEM

NVG COCKPIT/CABIN
I/R FORMATION LIGHTS
IR EXTERIOR LIGHTING
IR SEARCH/LANDING LIGHTS
APR-39(XE-2)
IMPROVED WHEEL ASSEMBLY

PLRS
FUEL VENT VALVE IMPROVEMENT
SECOND ARC-182 UHF/VHF RADIO
SECURE VOICE
FATIGUE VIBRATION MONITOR
HF RADIO (SECURE)
ELT
VOR/ILS
LASER WARNING RECEIVER
CRASHWORTHY TROOP SEATS
FASTROPE HARDWARE
UPGRADED HEELS
NVG HUD
LIGHTWEIGHT PILOT/COPILOT SEATS
STANDARD COMPASS

Table 2

NEW PRODUCTION CH-46X CONFIGURATION

NEW PRODUCTION CH-46E

COMMUNICATION
- HAVEQUICK/SINGARS
- SATCOMM (4:1/A:B KITS)

NAVIGATION
- MULTI-MODE RECEIVER
- NAVIGATION FLIR
- HELMET MOUNTED DISPLAY
- DIGITAL MAP REFERENCE SYSTEM

GLASS COCKPIT MANAGEMENT SYSTEM
- MFD'S
- CDU'S
- STANDBY INSTRUMENT PANEL
- DUAL, 1553 DATA BUSS

ASE
- ZERO DRAG EEDS UPGRADE
- WIRE DETECTION/WARNING
- LIGHT WEIGHT ARMOR
- FLY-BY-WIRE CONTROLS

PERFORMANCE
- ENGINE UPGRADE
- ROTOR SYSTEM UPGRADE
- 21 INCH CORD ROTOR BLADE

MISSION PLANNING SYSTEM
- INTERFACE WITH TAMPS

AIRFRAME
- ONE EXTERNAL STORES RACK
- DUAL POINT HOOK SYSTEM

The helicopters would be cheaper if the CH-53Es were used in a double sling mode--meaning they were rigged to carry two HMMWVs instead of one. Under the double sling proposal, the Corps would need only 225 CH-53Es and 478 UH-60s to meet its needs, saving about $2.2 billion over the Osprey. CMC reported that he considered this dialogue of dual sling options totally ridiculous. "It has nothing to do with coming from the sea in a wide variety of scenarios...It has nothing to do with warfighting."[21]

To make the double sling work, vehicles must be bolted together on ship before they may by carried ashore, creating an extra logistical and administrative burden. Once ashore, the equipment must be unbolted before it can be used, which would impede the speed and flexibility of the assault. Anyone who has ever planned an amphibious operation knows we don't need a problem like this. The deck would be fouled for a long time while we bolted the vehicles together. There simply isn't enough room aboard a ship to do this effectively.

The CH-53E and UH-60 mix has other problems. The CH-53E was built for logistics and endurance on the

battlefield. It was never designed as an assault helicopter, but we have used it like that in some situations. It simply was not designed to land on the sloping terrain in an assault like a CH-46, and it has a tremendous radar signature.

After all the studies, proposals, and counter-proposals the Secretary of Defense recently testified that although the MV-22 is a great concept, it is simply not affordable. The SecDef is correct if the MV-22 was only bought by the United States Marine Corps. Given the era of declining budgets, the Pentagon must consider multi-mission multi-service aircraft for the future. The V-22 has potential for missions like antisubmarine warfare, special ops, and drug interdiction. We are at the upper edge of the helicopter technology envelope and if we want to make a significant leap in capability, we must pursue a different avenue. One might say that it is an affordability problem and simply put, we cannot afford to take a step back in time. We must give our warfighting CINCs an enhanced force multiplier capability that becomes more and more important as we down size.

ONE COMMON AIRCRAFT FOR JOINT USE

The answer to the Marine Corps' medium lift requirement in the assault support piece could well be an aircraft for all services. The versatility and flexibility of the V-22 allow one aircraft to be used for many missions. The V-22 tiltrotor has growth potential far beyond that needed to meet current joint service operational requirements. The services recognized this potential when they responded to a 1984 Department of Defense request to identify future missions that could be performed by the V-22. Twenty-six additional missions were named. They included Navy/Marine Corps missions such as airborne refueling, mine warfare, over-the-horizon targeting, Signal Intelligence (SIGINT), electronic warfare, battle group surveillance-intelligence , carrier/surface ship onboard delivery, airborne early warning and antisubmarine warfare. The Air Force included future missions such as combat rescue, light intratheater transport, aerial refueling, missile site support, medical evacuation, operation support airlift, and forward air control. The Army stressed their need for high-speed extended-range tactical mobility.[11]

Since 1984, the services have defined future missions that could be performed by the V-22. The Marine Corps seeks to accomplish the missions of Presidential support, aerial refueling, airborne command and control, airborne Direct Air Support Control (DASC), airborne early warning, and raid pathfinding with a common airframe in their drive to achieve an all-STOVL Marine aviation capability by the year 2010. The Navy seeks an advanced tactical surveillance/support platform to accomplish the missions of aerial refueling, carrier and vertical onboard delivery, passive electronic warfare, antisubmarine warfare, active electronic warfare and airborne early warning. The Army seeks a common aircraft for long-range high-speed medical evacuation, priority logistics support, and special operations. All the services seek a self-deployment capability to reduce their reliance on strategic airlift and sealift. (See Table 3)

Table 3[23]

V-22 Growth Potential

CURRENT REQUIREMENTS		FUTURE REQUIREMENTS	
MARINES	Amphibious Assault Sustained Operations Ashore Pre-Position Operations Contingency Operations Presidential Support	MARINE VARIANTS	Aerial Tanker Command / Control Airborne DASC Electronic Warfare Clandestine Pathfinder Airborne Early Warning Night Station SAR
NAVY	Strike Rescue Special Warfare Fleet Logistics Support	NAVY VARIANTS	Antisubmarine Warfare Passive Electronic Warfare Carrier Onboard Delivery Vertical Onboard Delivery Aerial Tanker OTH Targeting Mine Warfare Mine Countermeasures
AIR FORCE	Long-Range Special Operations	AIR FORCE VARIANTS	Air Rescue Light Intratheater Transport Aerial Tanker Gunship / CAS / FAC Missile Site (SAC) Support
ARMY	MEDEVAC Priority Logistics Support Special Operations		Aeromedical Evacuation Joint Emergency Evacuation Range Support Operational Support Airlift
		CIVIL	High-Density Passenger Traffic Cargo Package Express Resource Development Corporate Executive Transport Public Service

MV-22 POTENTIAL/A LOOK AT PAST CONTINGENCIES

As we've looked at the Marine Corps assault support issues and a possible replacement for the aging CH-46, we have yet to look at a comparison or possible enhanced capabilities that the MV-22 might provide. A look at Desert Storm can provide an opportunity to compare developmental systems (MV-22) with demonstrated capabilities of systems already in the field.

Deployment:

Deployment of a large force is very complex and difficult at best. The major pacing factors of a large force deployment are the distances and the amount of critical and timely available lift.[24] As we look at the possible hot spots around the world, it is obvious that a strong naval force will still be necessary. With that in mind, it is even more critical that we don't over utilize precious deck space and overload strategic airlift with important, but cumbersome, assault support aircraft. It is with this concern for critical lift that I elaborate on the capabilities of a new technology, the MV-22 Osprey.

Like Air Force and Marine Corps fighter and attack squadrons, the MV-22 is capable of self-deployment

around the world, freeing up critical strategic lift. As a comparison, forty-four MV-22's could have been in Saudi Arabia fourteen days sooner than an equivalent CH-46/CH-53D force, saving eighteen C-5 loads. This is equivalent to 105 UH-60s and would save the Army the same number of C-5 sorties. The MV-22 could have flown directly to its sea or land base in the desert, avoiding airport congestion. (See Table 4)

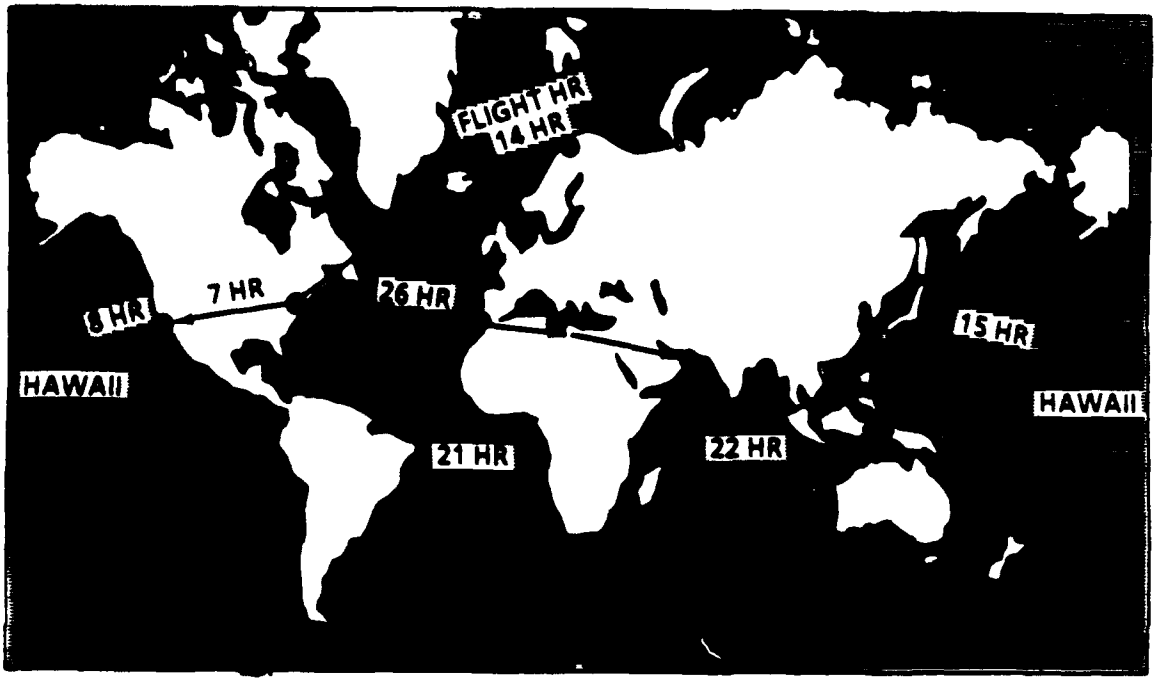
Amphibious Operations:

Although an amphibious assault is not always desirable or required, the MV-22's outstanding speed, range, and lift capability provide the CINC with many options not afforded by traditional vertical lift platforms. The MV-22 can deliver more soldiers or marines from a point seventy -five miles over the horizon faster and safer, affording the commander a vertical envelopment option that might otherwise be ruled out due to threat and distance.

Within this scenario, the advantages offered by an MV-22/CH-53E force compared with an equal lift capable CH-46/CH-53 force in a vertical amphibious assault are provided below and are significant. The speed, load, and range capabilities of the MV-22 provide an

Table 4-3

Worldwide Self-Deployment



overwhelming advantage. For example, in order to land assault elements of a Marine Expeditionary Brigade within ninety minutes in a landing zone twenty nautical miles (NM) inland, a CH-46E/CH-53E force would have to launch from a point no further than twenty-five NM offshore. Given the same scenario, an MV-22/CH-53E force could launch at seventy-five NM offshore and fly twenty NM inland all within the ninety minutes.[15] In cases where the water is too shallow or reefs prevent deep draft ships access, this would clearly be an advantage. The MV-22's enhanced speed, range, and lift capacity would have opened up most of Kuwait and Southern Iraq to vertical envelopment from amphibious ships without hazarding the fleet.

Tactical Recovery of Aircraft and Personnel (TRAP) Mission:

The TRAP mission is by nature very hazardous and unnerving, yet most essential for the maintenance of high morale among the flying units. If, in fact, we would experience downed aircrews, the MV-22 would provide a most proficient platform not available to the services before. From experience, I know many rescue attempts have not been flown simply because of long

distances of downed aircrews from friendly lines. The MV-22 provides a significantly greater probability of rescuing and returning aircrews with the least possible risk due to its enhanced range, speed, and survivability. Its increased range almost doubles the area of coverage of a CH-53. With the probability of rescue decreasing with each one hour on the ground, the advantage provided by the MV-22 is overwhelming.

Additionally, considering the emphasis during Desert Storm on night operations, the probability and frequency of night trap missions were increased. The night adverse weather capability of the MV-22 would have significantly enhanced the aircraft's ability to effect successful rescues at night, thereby further enhancing both downed pilot and trap aircrew survivability.

Special Operations Capable (SOC)

The same performance characteristics that enhance the MV-22's capabilities provide the CINC with an outstanding special operations platform. Hostage rescue over long distances, special reconnaissance, airfield seizure, and direct action against scud sites are very feasible and are but a few of the special

operations missions that the MV-22 can enhance for the CINC.

In many cases, helicopters simply can not meet the vital requirements for range, speed, survivability, hover power, and transit altitude. Additionally, SOC forces prefer to execute missions under cover of darkness because of the clandestine nature of most of their operations. Therefore, it becomes imperative for mission success to have a vertical lift capability with sufficient speed to infiltrate, carry out the mission, and exfiltrate as swiftly as possible. This tactic maximizes the elements of surprise and stealth utilizing the cover of darkness to conceal movement. If we were to have deployed conventional helicopters to hit key targets north of Baghdad, it would have taken over six hours of transit time from Saudi Arabia to get to the target and return again. The MV-22 could have accomplished the same mission in half the time.

The Medevac Role:

To an aviator, speed is life. The same can be said for the wounded. The time elapsed between an injury and appropriate medical care can be directly linked to the mortality rate. The obvious speed

advantage of the MV-22 can make a significant contribution that will save lives. If we were to have taken massive casualties in Desert Storm the medical facilities in northern Saudi Arabia would have quickly reached saturation. The range and speed advantage of the MV-22 would have provided capabilities to evacuate the injured to hospitals in central Saudi Arabia, neighboring friendly countries, or hospital ships.

Chemical and Biological Survey Operations

If Iraq would have employed chemical or biological warfare as threatened, a quick, responsive, accurate chemical and biological survey to determine areas contaminated and the degree of contamination would have been a priority. To date, current doctrine utilizes conventional helicopters and ground vehicles to monitor a suspected chemical or biologically contaminated area. Helicopters and ground vehicles require special equipment to measure contamination and to protect the air crews and ground crews. The MV-22 has a built-in chemical and biological protection and detection system. This system not only protects the aircrew and passengers when flying through nuclear, biological and chemical agents, but also provides the MAGTF Commander

with an efficient survey and detection capability not heretofore available.

Blocking Force

The significantly reduced sound footprint that the MV-22 brings to the battlefield provides the tactical commander the luxury of stealth not available before now. The obvious advantage would be an expansion of the battlefield, gaining surprise, and maintaining momentum beyond the enemy's ability to counter any movement.

CONCLUSION

As we learn from the past and plan for the future, it is imperative that we consider new technologies that will help ensure success. If the MV-22 had been available in Desert Storm, our forces would have been more capable. Deployment time and cost could have been significantly reduced. The MV-22, when deployed in concert with helicopters and fixed-wing assets, will provide a quantum increase in force effectiveness. Its enhanced range, speed, and survivability will be a significant force multiplier. The MV-22 can reduce risk, expand the battlefield, and save lives. It is but one example of improved capabilities that should be

considered as the number of warfighters available to the CINC decreases.

Marine aviation remains one of the most flexible, responsive, and versatile weapons available to our combat CINCs. When teamed with our Navy partners, naval aviation's ability to be anywhere, anytime to carry out U.S. policy is unrivaled.[17]

Perhaps more important, naval aviation can carry out its missions without dependence on host nation support or overflight rights and without the operational encumbrances that are associated with second party agreements. On the other hand, if the scenario dictates, we are just as capable of operating from shore-based facilities.

As the Corps' future size is argued and discussed, it is imperative that we are prepared to provide the force in readiness that our National Command Authority expects. Decisions on numbers of equipment and their capabilities should not be made in a vacuum or solely because of cost, but rather for how they might enhance our ability to carry out our mission.

We must continue to possess the means to conduct successful forcible-entry amphibious operations. The

Corps' assault support arm is a critical element in this equation.[28] Without the enhanced performance the MV-22 can provide our military planners, this capability may deteriorate as we downsize.

ENDNOTES

1. Lawrence H. Garrett III, Frank B. Kelso, Admiral, U.S. Navy, and A. M. Gray, General, United States Marine Corps, "The Way Ahead", Naval Institute Proceedings Magazine, April 1991, pp.36-45.

2. Ibid.

3. Wayne P.Hughes, Jr., Captain, (USN/Ret.),"The Trends and Constraints of Technology", Fleet Tactics: Theory and Practice, Naval Institute Press, Annapolis, MD, p. 213.

4. U. S. Marine Corps, Marine Aviation, FMFM 5-1, Quantico, 1979.

5. U. S. Marine Corps, Assault Support, FMFM 5-3, Quantico, 1979.

6. Keith A. Smith, LtGen., USMC, "Marine Aviation FY 86 Posture Statement", Marine Corps Gazette, 69, No.5, May 1985, pp. 49-56.

7. Ibid.

8. Robert R. Ropelewski, "Marines Shun Runways in Future Fighter Plans", Armed Forces Journal International, August 1989.

9. Duane A. Wills, LtGen., "Aviation Posture Statement FY-92", Marine Corps Gazette, May 1991, p. 31.

10. James H. Schaefer, Col., USMC, V-22 Program Manager, NAVAIRSYSCOM, Washington, D.C., interviewed by Col. Donald E. Beaver, 18 January 1992, Carlisle Barracks, PA.

11. Robert Garner, Col., USMC, Deputy Director Code APW, Aviation Department, Headquarters Marine Corps, Washington, D.C., interviewed by Col. Donald Beaver, 27 January 1992, Washington,D.C.

12. Ibid.

13. U.S. Congress, Senate, Committee on Appropriations, Institute for Defense Analysis Study of V-22 Osprey, Hearing 101st Congress, 2d Session, 19 July 1990, (Washington:GPO 1990).

14. Schaefer interview.

15. Elizabeth Donovan and David Steigman, "Gray: V-22 Substitute Scheme 'Rediculous'", Navy Times, March 5, 1990, p. 4.

16. David F. Bond, "CH-46E Replacement May Be CH-46X: Marines Believe UH-60 is Too Small", Aviation Week and Space Technology Magazine, February 19, 1990, p.18.

17. J. P. Cress, Director, Naval Air Systems Command Detachment, Program Manager Air (Field)-266, Marine Corps Air Station, Cherry Point, North Carolina, letter about USMC CH-46 restart program.

18. Schaefer interview.

19. Action Officer, USMC, Deputy Director Code APW, Aviation Department, Headquarters Marine Corps, Washington, D.C.

20. Ibid.

21. Duane A. Wills, LtGen., "Aviation Posture Statement - FY92", Marine Corps Gazette, May 1991, p. 31.

22. American Institute of Aeronautics and Astronautics,"Joint Services Advanced Vertical Lift Aircraft", Applications of VSTOL and STOVL Technology to Battle Group Concepts, 23 Sept 1991.

23. V-22 Growth Potential, Service Requirement Data, Source unknown.

24. J.Torsak, LtCol., and Philip Shutler, USMC, "Expeditionary Marine Aviation", Amphibious Warfare Review, Vol. 8, No. 2, summer 1990, pp. 64-68.

25. Worldwide Self-Deployment, Map, source unknown.

26. Schaefer interview.

27. Duane A.Wills, LtGen.,"Aviation Posture Statement - FY92", Marine Corps Gazette, May 1991, p.31.

28. L. Edgar Prina, "The Corps' New Leader Has a Hard Act to Follow and a Hard Road Ahead", Almanac of Seapower,February 1992, p. 4.