

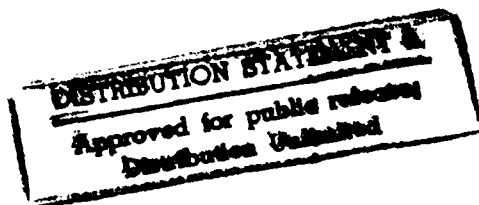
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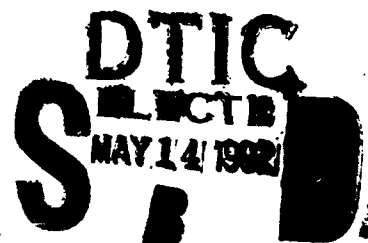
ARMED HELICOPTERS FOR THE U.S. NAVY



by

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A paper submitted to the Faculty of the Naval War College in partial satisfaction of the requirements of the Operations Department.

The contents of this paper reflect my own personal views and are not necessarily endorsed by the Naval War College or the Department of the Navy.

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13 February 1992

92-12763



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13 Feb. 92

REPORT DOCUMENTATION PAGE

1a REPORT SECURITY CLASSIFICATION UNCLASSIFIED		1b RESTRICTIVE MARKINGS	
2a SECURITY CLASSIFICATION AUTHORITY		3 DISTRIBUTION / AVAILABILITY OF REPORT DISTRIBUTION STATEMENT A: Approved for Public Release; distribution is unlimited	
2b DECLASSIFICATION / DOWNGRADING SCHEDULE		5 MONITORING ORGANIZATION REPORT NUMBER(S)	
4 PERFORMING ORGANIZATION REPORT NUMBER(S)			
6a NAME OF PERFORMING ORGANIZATION OPERATIONS DEPARTMENT	6b OFFICE SYMBOL (If applicable) C	7a NAME OF MONITORING ORGANIZATION	
6c ADDRESS (City, State, and ZIP Code) NAVAL WAR COLLEGE NEWPORT, R.I. 02841		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) ARMED HELICOPTERS FOR THE U.S. NAVY (U)			
12 PERSONAL AUTHOR(S) LCDR TOWNSEND G. ALEXANDER, USN			
13a. TYPE OF REPORT FINAL	13b. TIME COVERED FROM TO	14. DATE OF REPORT (Year, Month, Day) 13 FEBRUARY 92	15 PAGE COUNT 29
16 SUPPLEMENTARY NOTATION A paper submitted to the Faculty of the Naval War College in partial satisfaction of the requirements of the Department of Operations. The contents of this paper reflect my own personal views and are not necessarily endorsed by the Naval War College or the Department of the Navy.			
17 COSATI CODES		18 SUBJECT TERMS (Continue on reverse if necessary and identify by block number)	
FIELD	GROUP	SUB-GROUP	
		ARMED HELICOPTERS, LAMPS, PENGUIN, ENHANCED SURVIVABILITY, MISSILES, GUNS, NAVAL OPERATIONS	
19 ABSTRACT (Continue on reverse if necessary and identify by block number) Given today's budget reductions in defense and a shift away from a concept of bipolar conflict towards one of regional stability, properly armed U.S. Navy (USN) helicopters will provide the unified commanders (CINCs) and joint task force commanders (JTFCs) with increased firepower and maximum flexibility. In order to properly support joint and combined operations across the spectrum of conflict and around the world, USN helicopters need to be armed with greater offensive capabilities. The focus of this paper is on active force USN helicopters currently employed and those anticipated to remain in service for at least the next 10 years. Recent world events (Desert Storm) have shown that a legitimate requirement exists for armed helicopters. Current USN helicopters can easily be armed with existing weapons systems. This paper will clearly demonstrate that arming helicopters is feasible and provides significant enhancement to the warfighting capabilities of the USN and the CINCs. Based on the information presented it is quite evident that we need to arm helicopters to meet the multiple threats of today and tomorrow.			
20 DISTRIBUTION AVAILABILITY OF ABSTRACT ☒ UNCLASSIFIED/UNLIMITED ☐ SAME AS RPT ☐ DTIC USERS		21 ABSTRACT SECURITY CLASSIFICATION UNCLASSIFIED	
22a NAME OF RESPONSIBLE INDIVIDUAL CHAIRMAN, OPERATIONS DEPARTMENT		22b TELEPHONE (Include Area Code) 841-3414	22c OFFICE SYMBOL C

Abstract of

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Given today's budget reductions in defense and a shift away from a concept of bipolar conflict towards one of regional stability, properly armed U.S. Navy (USN) helicopters will provide the unified commanders (CINCs) and joint task force commanders (JTFs) with increased firepower and maximum flexibility. In order to properly support joint and combined operations across the spectrum of conflict and around the world, USN helicopters need to be armed with greater offensive capabilities. The focus of this paper is on active force USN helicopters currently employed and those anticipated to remain in service for at least the next 10 years. Recent world events (Desert Storm) have shown that a legitimate requirement exists for armed helicopters. Current USN helicopters can easily be armed with existing weapons systems. This paper will clearly demonstrate that arming helicopters is feasible and provides significant enhancement to the warfighting capabilities of the USN and the CINCs. Based on the information presented it is quite evident that we need to arm helicopters to meet the multiple threats of today and tomorrow.

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ARMED HELICOPTERS FOR THE U.S. NAVY

CHAPTER I

INTRODUCTION

Current U.S. Navy employment doctrine follows the Composite Warfare Commander (CWC) concept of operations. Under this concept, a carrier battle group (CVBG) or force provides a CINC or JTFC with significant firepower and capability. However, with future force structure uncertain and a shift away from global war with the former Soviet Union, CINCs and JTFCs may not always have a CVBG available. Special task groups will be formed and tailored to meet specific needs and threats. These forces, depending on their composition, might lack any significant airborne offensive capability which would limit the flexibility and response available to the theater commander. The survivability of the surface ships may also be threatened.

With no foreseeable decrease in naval force commitments it is clear there is a need to arm USN helicopters to provide force protection and power projection. The CINCs want flexibility in responding to conflicts and have requested armed naval helicopters through JSCP inputs.¹ The helicopter assets are in place and can easily be adapted to new missions. The weapons needed to enhance the helicopter's capabilities are in existence and in use with other platforms. These systems can be easily adapted to USN helicopters and the aircraft themselves can be easily modified.

Naval operations in the Arabian Gulf during Desert Storm most recently demonstrated the effectiveness of armed naval helicopters. USN assets worked in conjunction with armed allied helicopters and effectively neutralized surface threats to coalition forces. These efforts had two very significant impacts. First, they provided accurate, quick responses insuring self protection for the surface units operating in harm's way. Second, these capabilities allowed carrier air wing (CVW) commanders greater flexibility in asset allocation.

The changing defense picture in the United States requires new thinking about the use of naval forces. The change in emphasis to regional crisis and lower intensity conflicts requires maximum efficiency and flexibility and a re-evaluation of naval force employment strategy.

This paper will review the shift in national defense and naval strategy and discuss how this shift affects asset employment for the future. It will also examine current and future employment options for USN helicopters, pointing out both capabilities and limitations. Those helicopters best suited and criteria for arming will be discussed. Suitable weapons systems and alternatives to arming USN helicopters will also be presented. Finally, conclusions and recommendations will be provided.

CHAPTER II

NAVAL OPERATIONS IN SUPPORT OF NATIONAL DEFENSE STRATEGY

STRATEGY

The recent Cold War victory has resulted in an intense re-examination of our national military strategy, military force structure and the dollars needed to fund defense. Our focus has shifted away from global war in a bipolar world to low to middle intensity conflicts involving regional stability. This fundamental shift has significant impacts throughout the breadth of our National Security Strategy.

The National Defense Strategy, published in August, 1991, lists deterrence, forward presence, crisis response and reconstitution as its four pillars.² The Navy will play extremely important roles in all aspects of this strategy, particularly in the areas of forward presence and crisis response. Naval forces can provide forward presence while avoiding the sensitivities of having US forces deployed on foreign soil. In crisis response naval forces can react rapidly and without need of host nation support. "In a time of decreasing availability of overseas bases for US land and air forces, the presence of capable naval forces near areas of potential crisis remains a key element of national security."³

The Maritime Strategy is in the evolutionary process as well. Protection of US lives and property continue to be USN missions and power projection and sea control will be vital to

the new challenges facing naval forces. Presence, security assistance, counternarcotic, counterterrorist and humanitarian assistance missions will become the focus of our efforts to promote regional stability.⁴ New concepts of operations are emerging for our surface ships. Deployed naval forces may consist of surface action groups, amphibious ready groups, surveillance groups or quarantine/interdiction groups.⁵ As the Navy continues to be the dominant service in forward presence and crisis response and the number of ships decreases, our ships will increasingly find themselves operating independently in support of national objectives. To put these units into potentially hostile environments without adequate self protection and offensive capabilities is irresponsible.

The concept of armed naval helicopters is not a new one. For example, the Royal Navy Lynx helicopter was originally armed only with ASW torpedoes. As force structure and funding shrank and aircraft carriers were decommissioned, Royal Navy leadership recognized the need to arm the Lynx offensively to give their forces greater firepower and flexibility. Now equipped to carry torpedoes, air to surface missiles and suppression guns the Lynx greatly expands the operational commander's options.⁶ With our carrier force shrinking and our commitments remaining or expanding the USN needs to take a hard look at the value of armed helicopters.

PLATFORMS

USN helicopters currently operate from a variety of ships

and perform numerous tasks. Although their missions are critical to the overall CWC concept, helicopters are currently equipped only to conduct offensive operations in Anti-Submarine Warfare (ASW).

The SH-2F Light Airborne Multi-Purpose System (LAMPS) Mark I embarks primarily in frigates, destroyers, guided missile destroyers and guided missile frigates. LAMPS MK I performs ASW, anti-surface surveillance and targeting (ASST), search and rescue (SAR) and medical evacuation (MEDEVAC) missions. The MK 46 torpedo is the only offensive weapon carried.⁷

The SH-3G embarks primarily in aircraft carriers as an integral part of the CVW. The H-3 performs a variety of missions, including ASW in the inner zone, plane guard/SAR for the air wing, logistics and MEDEVAC. The H-3 is only equipped with the MK 46 torpedo. The H-3 is currently being replaced by the SH-60F. This very capable aircraft possesses outstanding performance ability and state of the art avionics and sensors. The only offensive capability it possess is the MK 46 torpedo. In addition to the 60F, HS squadrons are currently deploying with two HH-60H aircraft. These helicopters are designed to provide combat SAR (CSAR) and support Navy Special Warfare (NSW) missions. The HH-60H currently is lightly armed with two door mounted M-60 machine guns.⁸

The CH-46D/HH-46D embarks in oilers and combat stores, ammunition and fast combat support ships.⁹ These helicopters provide vertical replenishment (VERTREP) of parts, food and

ammunition to the ships of the CVBG, in addition to supporting logistics, SAR and MEDEVAC missions. These aircraft have no offensive weapons systems.

The SH-60B LAMPS MK III embarks in FFG 7, DD 963 and CG 47 class ships. Designed to replace the H-2 aircraft, the H-60 has superior performance and sensor capabilities to conduct ASW, ASST, SAR and MEDEVAC missions. Aircraft currently in the fleet possess only the Mk 46 as an offensive weapon. This aircraft is scheduled to deploy with the AGM-119 Penguin MK 2 MOD 7 missile beginning in FY 93, and this weapon will significantly enhance a commander's ability to project Anti-Surface Warfare (ASUW) power.¹⁰

Although other helicopters exist in the Navy's inventory these aircraft are the primary deployers, particularly within a battle group. The main reason for the limited offensive capabilities of these platforms is that the CVW aircraft currently provide for defense and power projection at sea and over the beach.

EMPLOYMENT

USN ships and aircraft have been involved in several operations during the past eight years which serve as excellent examples of the expanded role helicopters could have played had they been armed. Not only would these helicopters have provided own ship protection but they would have benefited the CINC as an additional source of firepower.

During freedom of navigation operations off Libya in 1986, Libyan corvettes and fast attack craft threatened USN surface units with their surface to surface missiles. Air wing aircraft were tasked to neutralize these threats and successfully utilized Harpoon and Rockeye munitions.¹¹ Had embarked helicopters been armed they could have effectively neutralized these threats, providing own ship self defense.

During Persian Gulf operations from 1987 through the USS Vincennes incident, USN forces were brought into direct conflict with hostile patrol boats (PBs) of the Iranian Navy (IN) and fast patrol boats (FPBs) of the Iranian Revolutionary Guard Corps (IRGC). US Army (USA) AHIP and USN LAMPS helicopters teamed up to effectively search, track and attack hostile contacts.¹² CVW aircraft and surface ships engaged and neutralized IN PBs and IRGC FPBs.¹³ The USN/USA team worked extremely well and many valuable lessons were learned from these joint operations. However, had LAMPS been armed they would have provided significant firepower and eliminated the requirement for a second, single engine helicopter.

During Operation Desert Storm Iraqi PBs and FPBs threatened coalition naval forces. Once again the equipment and skills of the LAMPS aircraft were called upon, in conjunction with Royal Navy Lynx helicopters, to locate and neutralize the Iraqi threats.¹⁴ USA helicopters and strike aircraft from the air wings were also employed to combat this threat. USN helicopters were also involved in interdiction operations and, if armed,

would have increased the efficiency and flexibility of these operations. These combined operations were extremely successful and further valuable lessons were learned, but armed USN helicopters would have proven well worth the investment.

CHAPTER III

CONVERTING CONCEPTS INTO REALITY

There is a need to rethink past policies concerning armed helicopters and move forward positively. The first step towards accomplishing this is to determine what helicopters will be in the Navy's future inventory and which of those are most suited to armament and mission changes.

WHICH SHOULD BE ARMED

The SH-60B will remain in service for at least the next 10 years and will continue to deploy with FFG, DD and CG class ships. DDG-51 Class destroyers will have compatible weapons systems but not the facilities to embark a LAMPS detachment. Later versions of the ARLEIGH BURKE class are planned to have embarking facilities.¹⁵ However, the budget environment of today may preclude the construction of these later versions. The 60B will continue to be the workhorse of the 'small boy' navy and lack of DDG-51 ships in which to embark should have no impact on the arming issue.

LAMPS MK III helicopters already operate in hostile environments, often outside the CVW protection umbrella. 60Bs and their parent ships have repeatedly demonstrated their capabilities to locate, identify and track hostile contacts in both power projection and self defense. Future employment concepts for our surface combatants will, in many cases, put these units out in the foreground in potentially hostile

situations, independent of a CVBG. 60B technology is new enough to make adaptation of additional systems cost effective. Upgrade programs are currently underway for this aircraft in several areas, most notably Penguin. This capability is a major step in the right direction. Based on the operating environment which the LAMPS MK III and her surface units can anticipate in the future, the extensive capabilities already discussed and limited DOD dollars which must be spent wisely, arming the 60B makes sense.

The HH-60H could easily find itself in situations where two M60 machine guns are inadequate. In support of CSAR and NSW missions, these aircraft will often be operating outside the carrier's umbrella and definitely in hostile environments. The needs for self protection and providing support to troops on the ground necessitate offensive capabilities greater than what they currently have. These aircraft, fresh out of the factory, contain state of the art performance and avionics systems, making integration of new systems relatively easy. Based on their potential to operate in extremely hostile environments, their compatibility to other H-60s, the ability to be easily modified and the need to spend limited dollars wisely, it makes sense to give these helicopters an offensive capability greater than they currently have.

WHICH SHOULD NOT BE ARMED

Although the Navy currently plans to buy new SH-2G aircraft and upgrade a handful of existing SH-2F helicopters, their role in future Naval operations is becoming limited. The primary ship

in which LAMPS MK I deploys is the Knox Class frigate, the majority of which are being retired from service. A few ships of this class will remain on active duty as reserve training ships (FFT), and will need LAMPS support. SH-2G helicopters will support the reserve fleet and continue to embark on a limited basis in FFG, DD, DDG and CG class ships which are unable to accommodate a LAMPS MK III detachment.

When embarked, an armed H-2 could certainly provide much better power projection and unit defense. The real concern is whether arming a relatively small number of aircraft is cost effective considering their potential for being in harm's way. If the primary employment of the H-2 becomes support to the reserve fleet the cost will probably be too high. Given the limited numbers of airframes proposed (currently 24), the uncertain future, the mission to support the reserves and the dwindling dollars available for defense, providing the H-2 with additional offensive capabilities does not make sense.¹⁶

The SH-3G helicopters are being replaced with the SH-60F. Because the 60F will almost always operate under the protective umbrella referred to earlier, there is no requirement for arming either for power projection or carrier self defense. Based on tasking, operating environment and limited dollars it does not make sense to arm these helicopters with additional offensive weapons capabilities.

The limited number of airframes within the Navy and Marine Corp inventory and slow attrition of these assets makes the

future of the H-46 uncertain. The Marines recognize the need to replace their H-46 and have been pushing hard for the V-22. However, the future of the V-22 is also uncertain. The Navy faces similar problems of limited assets, airframe attrition and no identified replacement. However, for the foreseeable future the H-46 will continue to be the workhorse of the deployed logistics fleet.

By the nature of the inherent limited self defense capability that logistics ships possess, these ships and their embarked aircraft tend to operate out of harm's way or rely on other surface, subsurface and air platforms for protection. If steaming independently in hostile waters, CLF ships will always have at least one small boy for ASW, ASUW and AAW protection. If integrated with a CVBG, the surface and air assets of the battle group will provide the necessary protection. Based on mission employment, availability of other units to provide protection, fiscal constraints and the uncertain future of the H-46 airframe, arming these helicopters does not make sense.

PROPOSED WEAPONS SYSTEMS

Many weapons systems are currently in existence, employed on other aircraft and could be suitable for Navy helicopter use. Promoting a new weapons system that is still in the research phase of the RDT&E process is unnecessary and risky. There are systems currently available that can be adapted to USN helicopters which are more than adequate.

As stated earlier, USN 60Bs will soon be armed with Penguin. Current plans call for 115 aircraft to eventually be modified to carry this superb weapon.¹⁷ Penguin gives significantly enhanced ASUW capabilities to ship commanders, JTFs and CINCs. Power projection and self defense can now be accomplished without CVBG assets and at a lower cost. This weapon is ideal for combatants and patrol boats, and could have been utilized with great success against Libya, Iran and Iraq.

As capable as Penguin is, it has limitations which require additional ASM capabilities. The 60B can carry only one at a time, based on weight and weapons station configuration. Also, Penguin is not effective against the smaller, FPB type threat. It seems apparent that USN ships will find themselves operating against PBs and FPBs more frequently. In order to counter this threat (for which small boats have only Harpoon, MK 45 five inch gun, MK 75 76mm gun and .50 caliber machine guns) the embarked helicopters should also be armed with a system like the AGM-114 Hellfire missile, which can be carried in loads of four, is easily adaptable to H-60s, is ideal for the FPB threat as well as fixed targets and is relatively inexpensive. The significant advantages to this weapon are that it is already in use, neutralizes a very real threat, gives more than one shot, and is cost effective.¹⁸

Helicopters also require forward firing suppression weapons for use against FPBs and other small craft, targets ashore and for self defense. The MK 261 2.75 inch rocket launcher can be

easily adapted, provides a nineteen shot area weapon capability, already exists and is very cost effective. In addition, a fixed, forward-firing .50 caliber machine gun would significantly enhance the helicopters offensive capabilities as well as self defense. These weapons provide considerable firepower, are inexpensive and can be easily adapted to the 60B and 60H.¹⁹

Critical in the self defense role would be a crew served automatic weapon mounted in the cabin door area. This weapon would provide vitally important firepower against small arms fire from small boats or ground forces. Many such weapons exist, but one particularly well suited for USN helicopters would be a 7.62 MM minigun. These weapons are easy to operate, inexpensive, available immediately and easily adaptable.²⁰

An associated system critical to LAMPS and CSAR missions but not currently installed on any Navy helicopters is a forward looking infrared radar (FLIR), which provides the ability to visually identify targets from a safe standoff range. There are numerous FLIR kits in use and available today. A laser designator is needed for employment of the Hellfire missile and is combined with FLIR on newer systems, which are available within DOD and can be easily adapted for USN use.²¹

How would we hang all this firepower on our helicopters? For Penguin, hard points already exist on later production 60Bs for the weapons pylon. Other aircraft designated to receive this system will be retrofitted. Another pylon, on the opposite side of the aircraft, would be attached to hard points. Employing

modular weapons kits, a combination of different weapons could be utilized, depending on mission and threat.²² These weapons give commanders great capabilities in power projection and unit defense, all with one ship and one or two helicopters. For LAMPS helicopters, a standard ASUW load might consist of Penguin and Hellfire. For coastal work against numerous small boats a load of Hellfire, rockets and .50 caliber might be the preferred load. The options are numerous. What is important is that this firepower gives the operational commanders, from the ship's commanding officer to a theater CINC, a great deal more firepower and flexibility.

How would this additional ordnance affect helicopter performance, maintenance and training? Penguin evaluation has already passed flight tests. The H-60 has expanded gross weight capability, allowing for the addition of new weapons pylons and systems. Squadron maintenance manning would require a small increase in the number of aviation ordnanceman (AO) to handle the additional weapons and ammunition. Other maintenance personnel, already in place, would be trained to maintain the avionics and associated equipment. A slight increase in training allocations, both in terms of flight hours and ammunition would be required to train the aircrews and maintain their proficiency.

The impact of additional weapons on magazine space for an HH-60H would be negligible on a CV. Slightly more critical would be the impact of similar requirements aboard the small boys and

although it doesn't appear to present any problems it requires careful study.

ENHANCED SURVIVABILITY

When operating in high threat environments aircraft require a capability for self defense in addition to offensive weapons. Although some H-2 and H-60 aircraft were modified for Persian Gulf operations, the majority of USN helicopters do not possess any enhanced survivability equipment. Current enhanced survivability packages (ESP) consist of the ALQ-144 infrared jammer, ALQ-156 missile warning system, ALE-39 chaff launcher and a crew served M60D machine gun mounted in the cabin door. The limitations of this package are incomplete threat spectrum coverage and lack of software integration to provide automatic countermeasures dispensing or threat warning to the aircrew.

With the potential to operate in hostile areas world-wide, all USN helicopters should receive an upgraded ESP. This package should include at a minimum, radar/laser threat warning, missile detection warning, countermeasures dispenser, IR jammers and side suppression miniguns. Critical to this package is the requirement for complete threat spectrum coverage as well as automatic countermeasures deployment/crew warning through integrated software.²³

OTHER ALTERNATIVES

Given the current DOD budget outlook, why not take armed helicopters that are already in service and utilize them instead?

Since the Navy has previously operated with Army helicopters, and the operations conducted in the Persian Gulf were truly successful, why not continue? The advantages of utilizing these assets are that they (1) represent a joint force, (2) are already weaponized, (3) are well equipped for night operations with FLIR/laser designator and night vision goggles (NVG) capability, (4) are small and compact fitting into surface ship hangars, (5) are covert, (6) are low cost to the Navy as no procurement is required and (7) have a proven track record. The disadvantages to employment are that they (1) are of limited availability and are owned by another service, (2) require advance warning for airlift and buildup and (3) require accessible shore basing facilities in the conflict area for Army and civilian contractor support. Further, these aircraft (4) are limited to the single mission of night attack, (5) have no search sensors (radar, IFF, ESM), (6) are not all weather configured and (7) can not link with own ship. In addition, these aircraft (8) are not protected from corrosion extremely prevalent in the shipboard environment and (9) are skid configured, restricting movement on the flight deck in moderate sea state conditions.²⁴ Given the nature of future conflicts, consistent use of these helicopters is unfeasible due to USA requirements for employment, their logistics support infrastructure and the lead time required for deployment. Unless already embarked, these helicopters are of no use in forward presence or crisis response missions.

The only other properly armed and suitably sized helicopter is the USMC AH-1 Cobra. The advantages of this helicopter are that it (1) is already part of the Navy/Marine Corps team, (2) has the weapons needed, (3) is armored for survivability and (4) is NVG equipped. FLIR and laser designator are scheduled for retrofit in FY-93. Additionally, the aircraft (5) is prepared to withstand the corrosive low, overwater environment and (6) can be supported from the logistics available on the amphibious ships. The disadvantages of the Cobra are that (1) availability is poor and (2) these assets are already committed to the amphibious forces as part of the MAGTF team. The Cobra also (3) possesses no search sensors or ability to link information to own ship. (4) Compatibility presents another serious disadvantage for the Cobra. Without the ability to fold the main rotor blades the helicopters will not fit into the hangars of FFG, DD, and CG class ships. With a blade fold system only certain ship's hangars can accommodate the aircraft. (5) The Cobra is skid configured and flight deck movement is limited by sea state.²⁵

Utilization of either of these options has a severe impact on the small boys: space. These aircraft must operate with LAMPS to utilize the radar, IFF, ESM and data link capabilities for location, tracking and targeting. Additional people, parts and aircraft severely strain the already limited space available on the small combatants. Their employment also limits the ships to one H-60. Increasing the firepower of LAMPS would require one

additional maintenance man (AO) and some additional magazine space. The number of aircrew remains the same.

Equally critical is that past instances of joint or combined helicopter operations using USN, USA, and UK helicopters have been successful because of lead time for planning and coordination. Future operations will most likely not have the assets and infrastructure in place.

In view of the limited number of suitable assets available to deploy and the significant disadvantages associated with these options, arming the 60Bs and 60Hs is the obvious choice. Both aircraft have superb capabilities to start with, can move from ship to ship with ease, have minimal impact on existing platforms and will be most likely out in front conducting forward presence or crisis response missions.

CHAPTER IV

A BRIGHT FUTURE

CONCLUSIONS

Employment of USN helicopters in the future will be significantly different. As the Navy Staff wrestles with the problem of providing the CINCs the assets required while simultaneously facing reduced operating budgets and force levels, one probable outcome will be the deployment of smaller groups of combatants where we once deployed a CVBG. In response to national defense requirements, Navy ships will continue to project power and provide sea control in support of forward presence and crisis response. Given this operating environment, the need to arm USN helicopters is valid.

Recent procurement of helicopters has provided the Navy with two extremely capable and uniquely suitable helicopters to be armed. These modifications will cost money, but the costs will be small compared to the cost of acquiring completely new systems. In days of tight budgets the Navy will have to spend wisely. Modifying an existing system to satisfy a valid requirement is wise spending.

In addition to existing helicopters, the weapons systems of choice already exist and are in use. Procurement costs will be reduced. Start up costs associated with new systems are avoided.

These upgrades will not have a negative impact on the ability of the 60B and 60H to perform their already established

missions. The Lamps helicopter will retain its capabilities in ASW, ASST SAR and MEDEVAC. The 60H will still perform CSAR and NSW missions. The addition of these weapons will enhance the ability to perform current missions, as well as provide greater flexibility to the operational commanders.

In summary, there is a valid need for arming USN helicopters. There are platforms in the Navy inventory extremely suitable to this arming, and there are weapons systems that satisfy the requirement.

RECOMMENDATIONS

Based on the conclusions drawn in the preceding paragraphs, several recommendations are proposed. Some are already in work. Money is probably the single most important criteria today when it comes to changing the status quo. Hopefully, funding issues will not negate the validity of the arming argument.

The first recommendation is for the DON to accept that armed helicopters are the smart way to approach future naval force structure and employment. The requirement has been generated by the CINCs, the utility has been demonstrated by past operations, and the potential for platforms and weapons systems exists today.

Arm all SH-60B and HH-60H helicopters. It has been shown that given missions, employment, capability and adaptability these two aircraft demonstrate the greatest potential to provide the fleet with armed helicopters.

Adjust the Required Operational Capabilities/ Projected Operational Environment (ROC/POE) for the 60B and 60H reflecting

new missions and capabilities.

Finally, budget the necessary dollars to (1)conduct required testing and evaluation, (2)procure the weapons systems, parts and ammunition, (3)modify existing and future airframes and (4)increase the necessary manpower and training allocations.

In light of the reduced forces available, the virtual elimination of the possibility of global war and the increased potential for involvement in low-intensity conflicts, significant changes are required. However, these changes are positive. They will allow the nation to fight smarter and more capably, which are valuable attributes as we head into the uncertain world of the 21st century.

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