

The Utility Helicopter Mission Is Still Essential

CSC 1993

SUBJECT AREA - Aviation

EXECUTIVE SUMMARY

Title: The Utility Helicopter Mission is Still Essential

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Thesis: The Marine Corps must replace or upgrade the UH-1N and purchase enough aircraft to meet operational tempo.

Background: The utility helicopter mission is essential to support MAGTF operations. The UH-1N has been performing this mission for almost 20 years and because of limited capabilities and inadequate numbers presently cannot conduct it satisfactorily. The Huey's replacement, VMAO, is projected to enter the fleet in 2015. Considering the likelihood of increased reliance on the Marine Corps to conduct operations ranging from low intensity conflict to humanitarian relief, the demand for a utility helicopter will also increase. The UH-1N will not be able to support this high operational tempo in the future.

Recommendations: The Marine Corps should purchase the H-60 Black Hawk and maintain a T/E of 12 utility helicopters in each HMLA squadron.

OUTLINE

Thesis: Due to limited capabilities and insufficient airframes, the UH-1N cannot effectively conduct the utility mission for the Marine Air Ground Task Force (MAGTF); therefore, a new aircraft must be purchased or a mid-life upgrade conducted and adequate numbers of aircraft purchased.

- I. Evolution of the UH-1N
- II. Utility mission is essential to MAGTF operations
 - A. MAGTF aviation assets
 - B. Validity of the utility mission
 - C. Missions assigned to UH-1N
- III. Dwindling assets
 - A. Out-of-production model
 - B. Aircraft attrition

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- IV. Continued high operational tempo
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Due to limited capabilities and insufficient airframes, the UH-1N cannot effectively conduct the utility mission for the Marine Air Ground Task Force (MAGTF); therefore, a new aircraft must be purchased or a mid-life upgrade conducted and adequate numbers of aircraft purchased. The "Huey" has had a distinguished history. A workhorse in Vietnam, it proved versatile and enduring in a variety of assigned missions. As a mix of helicopters was added to the Marine Corps inventory, the UH-1 continued to prove invaluable at "filling the gaps." The Huey performed the crucial mission tasks for which the other aircraft were neither configured nor suited.

In the early 1970's the Marine Corps received the latest model, the UH-1N, which is still in service after almost 20 years. In the 1980's the Huey performed well but in recent years there has been a marked reduction in the quality of its performance. High utilization with no mid-life upgrade or service-life-extension program (SLEP) has resulted

in airframe fatigue and limited capabilities. Compare the Huey to the capabilities of new model helicopters in avionics, airspeed, and cargo load and a wide gap is obvious. The replacement for the UH-1N, the Advanced/Attack/Observation/Utility/Platform (VMAO), is due to enter the fleet circa 2010-2020.

Considering future budget constraints and project funding competition this date could be much further out. Several questions must be answered. Is the utility mission still essential? Can the remaining three Marine helicopters, CH-53, CH-46 and AH-1, accomplish the utility mission? Can the Huey stay in service until 2010 without an upgrade? Would it be more cost effective to conduct a mid-life upgrade or purchase a new type aircraft to perform the utility mission?

Is the utility mission still essential? MAGTF aviation employs a complete assault support helicopter capability. Heavy logistics is performed by the CH-53 while the bulk of the troop transport is assigned to the CH-46. Anti-mechanized operations, helicopter escort and close-in-fire-support (CIFS) are tasked to the AH-1 W. In any operation there are numerous tasks which, although simple, are essential to the success of MAGTF operations. These tasks are assigned to the utility helicopter. The UH-1N's primary assigned mission is command and control for the helicopter assault element. The Huey accompanies the helo assault wave to the objective with the assault support coordinator (airborne) (ASC(A)) and often the heloborne unit commander (HUC) onboard. During the landing and consolidation phase, if tactically feasible, the UH-1N enables the ground commander to observe his objective and, when ready, land at his command post. The ASC(A) ensures the smooth flow of aircraft into the objective area.

The Huey is also assigned several secondary missions that include troop transport,

medical evacuation, search and rescue (SAR), armed escort (ground and airborne), CIFS and airborne supporting arms coordinator. (3:1) These missions can be performed by the other Marine helicopters, but the UH-1N provides flexibility and allows the most economical use of aviation assets. The airframe is relatively cheap to fly and in the high-demand periods of pre-assault, assault, post-assault the other aircraft can be used for their primary missions. It is not economical to task a CH-46 to transport the ground commander around the battlefield when that aircraft could be used to transport essential troops and supplies.

Another example is armed escort of transport aircraft to the landing zone (LZ). An AH-1 could be assigned the mission but this would prevent it from being used in an anti-mechanized role. Considering there are only four AH-1W in a typical deployed MEU, where would they be best utilized? Tasking UH-1Ns to escort sorties releases the Cobras for other critical missions. Assigning utility missions to other assault support aircraft would result in task overload and a significant loss of flexibility. The Huey ensures no mission gaps occur within the helo assault support element; therefore, the UH-1N in the utility mission provides necessary versatility and flexibility that is essential to the MAGTF. Tasking this mission to the UH-1N allows for efficient use of other helicopters. However, the question is: Can the UH-1N continue to perform the utility mission until it is replaced in 2010?

The UH-1N is an "out-of-production-model"; therefore, new UH-1Ns cannot be purchased. Flight time continues to add up on the existing airframes and with an attrition of so many aircraft per year due to accidents the use of the remaining aircraft increases. As an example, MEU deployment requirements on the east coast squadrons

(HMLA 167, 269) are demanding. Frequently between chops, which is the assignment of personnel and aircraft to deploying HMM squadrons, the squadrons are left with only two to four aircraft for a month or two until the MEU detachment being relieved returns. This type of demand has started programs like Aircraft Service Period Adjustment (ASPA), which in simple terms is an inspection to determine if the aircraft must be sent for rework at its normal interval. However, it is not the detailed inspection and rework performed at depot level. If an aircraft passes inspection, the minor discrepancies are corrected and the aircraft remains in the fleet for another year until its next ASPA inspection. This is good for fleet and MEU demands but it accelerates airframe fatigue. Many aircraft have now passed ASPA inspections two and in some cases three times. Not surprisingly, the aircraft have shown significant airframe fatigue such as engine deck deterioration and liftbeam cracks. The liftbeam is the main attachment point between the transmission and the airframe. Airframe fatigue may also cause transmission-to-driveshaft-misalignment which is possibly linked to two recent fatal mishaps. This being the case, how is this airframe expected to last another 20 years?

When it was introduced in the 1970's, the "N" had increased capabilities over older models but with little change in maximum airspeed. Entering the 1990's its performance has fallen far behind modern helicopter technology and, in respect to current MAGTF helos, it is the least capable. The UH-1N lacks airspeed compatibility with other assault platforms. Its maximum rated speed is 130 knots (kts) but at maximum gross weight the velocity-never-to-exceed (VNE) becomes 110 kts at sea level and decreases rapidly at higher altitudes. (6,1-4-5) In contrast, the CH-46 has a cruise airspeed of 130 kts, CH-53 150 kts, and the AH-1W 130 kts. To capitalize on

surprise from over-the-horizon launch positions, 20 to 30 kts makes a significant difference. The UH-1N's limitations force the helo assault wave to fly at 90 kts vice a capability of 130 kts. Speed is a tactical advantage that must not be squandered.

The cabin capacity is rated for 13 passengers, 8 combat troops or 6 litters, a useful capability. This is based on the standard fuel load that equates to approximately 1.5 hrs. To complete a typical command and control mission, the Huey requires a flight endurance time of roughly 3 hours. To compensate for the fuel shortfall, an auxiliary fuel bag (aux bag) was developed and is now standard for most missions. The bag is installed in the interior aft cabin. The fully loaded weight is 1000 lbs. and takes up two passenger seats. Although this solves the flight endurance problem, it significantly reduces the cargo-carrying capacity. The maximum gross weight for the aircraft is 10,500 lbs. The basic weight is approximately 6800 lbs. With full fuel for three hours (2400 lbs would be internal, 1000 lbs. in the aux bag), and crew of three (600 lbs), a quick calculation comes 9800 lbs., leaving only 700 lbs for cargo and passengers. (Table I) With the command and control radio package weighing 100 lbs, there is room for only three passengers.

Table I
USEFUL CARGO LOAD

Basic wt	6800
Fuel	2400
<u>Crew</u>	<u>600</u>
Gross wt	9800
<u>Max wt</u>	<u>10500</u>
Cargo	700

At a maximum air speed of 110 kts this doesn't provide much capability. Then, too, calculations for an ordnance load also impose restrictions.

Without a comprehensive upgrade, the UH-1N will become insupportable long before the 2015 planned retirement date. A utility platform, by nature of its multi-mission capability, the Huey provides increased efficiency and productivity. These mission tasks are essential to the success of the MAGTF. Therefore, the Marine Corps has two options: (1) either conduct a mid-life upgrade of the UH-1N or (2) purchase a new helicopter. A mid-life upgrade must significantly increase the Huey's capabilities to be compatible with the existing Marine helicopters. As for a new aircraft, there are several existing "off-the-shelf" helicopters that could satisfy the combat utility role, e.g., the UH-60 Black Hawk, the Bell 412, or the Sikorsky S-76.

The objective of Bell Helicopter's UH-1N Mid-Life Upgrade (MLU) program is to extend the service-life of the UH-1N until VMAO introduction, expand mission capability, reduce vulnerability, lower life-cycle costs, be affordable, and increase safety.

(5) The MLU would increase power to the main rotor by 25%. This would be accomplished by installing GFE T400-402 engines (1970 SHP from 1800 SHP);

upgrading the transmission (1593 SHP from 1290 SHP); installing a composite four-blade, manual-folding, main rotor; and installing a new KAFLEX main driveshaft. The maximum gross wt. would then be increased from 10,500 lbs. to 11,900 lbs. with a decrease in the empty wt. by 150 lbs. The useful cargo load would thus be 2100 lbs. for the MLU vice 700 lbs. for the UH-1N. This is calculated for a three-hour mission and is a significant improvement in capability. The installation of the four-blade rotor would increase maneuverability and safety, reduce vibrations by 40% and lower maintenance costs. The reduction in vibrations would reduce pilot fatigue and increase the life of critical components. The cruise airspeed would increase to 130 kts. with a VNE of 140 kts. (5) This speed improvement would enable the Huey to keep up with the assault helicopter wave allowing utilization of the CH-46's full airspeed potential.

Fuel capacity is increased by 113 gals., giving an endurance of 3.0 hrs. and a combat radius of 170 nm. An improved auxiliary fuel system designed by the USAF can also be incorporated for specified missions, further increasing the Huey's range and endurance. New energy attenuating crew and passenger seats will increase survivability in a crash. Ballistic improvements will be minor but include improved pilot seat armor and main rotor blades that will tolerate a 14.5mm hit. In addition, the airframe will be strengthened and the liftbeams replaced. (5)

The second option is to replace the UH-1N with a new-type helicopter. The Vietnam experience changed the Army's requirements for the next generation utility helicopter. High performance, survivability, reliability, availability, and maintainability became the goal. The Huey had performed remarkably but it had many shortcomings. In 1974 Sikorsky was awarded the Army contract to build the H-60A Black Hawk and the first

production helo was delivered in 1978.

The Black Hawk is now in all five branches of the US military service. The USMC flies the VH-60 at HMX-1 for Presidential support. Besides the missions assigned to USMC utility role, the Army also employs the Black Hawk for electronic warfare, anti-tank warfare and mine-barrier operations, thus proving its versatility. The Black Hawk has undergone several variations to accommodate different missions within the services. Of particular interest is the Navy's SH-60B Sea Hawk because of its shipboard compatibility which is necessary for all USMC helicopters. The Sea Hawk is used as a light airborne multi-purpose system (LAMPS) Mark III with primary missions of anti-submarine warfare (ASW), and ship surveillance and targeting (ASST) with secondary missions of SAR and logistics support. Although the H-60 is larger than the UH-1 its footprint would have minimal effect on LHAs and LHDs.

The Black Hawk variation designed for the USMC is the H-60L. It is a single-rotor, twin-engine helo large enough to carry 15 troops plus a crew of 3 for normal combat operations. Up to 20 troops could be carried in a high density configuration. Empty weight is 13,027 lbs., mission gross weight is 16,600 lbs. (crew and full fuel) with a maximum gross weight of 22,000 lbs. This allows for 5,400 lbs of cargo load. The max load that can be carried on the external sling is 8000 lbs., thus lifting a fully loaded HMMWV with its crew. (1:18)

The Black Hawk's endurance is admirable. With 12 troops and the remaining cargo capacity used for fuel it has a combat radius range of 225 nm. With the External Stores Support System (ESSS) an additional 2500 lbs. of fuel can be carried giving a total flight of six hours and extending the combat radius to 400 nm. (1:24) This is a

significant advantage over the MLU in the command and control role.

Cruise airspeed for the H-60L is 145 kts with a VNE of 165 kts. This speed advantage over the UH-1N will not only allow the utility helo to stay up with the assault helo wave but also will give it a sprint advantage to reconnoiter the landing zone prior to the transports landing.

Another impressive feature of the Black Hawk is its ballistic tolerance. There are no areas vulnerable to a 7.62mm round. This is accomplished through strategic placement of redundant systems and protection of all critical components. No matter where a bullet penetrates the flight controls, it is impossible to cause separation. The entire four-blade main rotor is also ballistically tolerant. The hub is invulnerable to 12.7mm hits while the blades will not fail after a single 23mm high explosive incendiary (HEI) round in the spar. (1:21) The pilot seats are armored and the transmission gear box is designed to operate for 30 minutes without any oil. The Black Hawk incorporates a suction fuel system on the engines in contrast to the UH-1N which has fuel pumps that feed the fuel into the engine. If a fuel cell is penetrated by a bullet it will not leak; air would be ingested but fuel would not be sprayed as in a pressure system. Fuel lines are flexible, self-sealing, and incorporate self-sealing break-away valves. The fuel tanks are self-sealing to 12.7mm ballistic damage. (1:14)

**Table II
CAPABILITIES MATRIX**

	UH-1N	MLU	H-60	
EMPTY WT. (lbs.)	6900	6725	13027	
MAX GROSS WT. (lbs.)	10500	11900	22000	
CARGO LOAD (lbs.)	700	2100	5400	3 hrs fuel
COMBAT RADIUS(nm)	85	170	225	
ENDURANCE (hrs.)	1.6	3.0	3.0	stand fuel
MAX ENDURANCE	3.0		6.0	aux fuel
MAX AIRSPEED (VNE)	130	140	165	
CRUISE AIRSPEED	100	130	145	
SURVIVAL MEASURES	LOW	LOW	HIGH	
UNIT COST (millions)	4.5	2.0	7.0	

As shown in the Table II, the Black Hawk provides a significant increase in capability but at a price. There are some additional costs such as maintenance support equipment, parts, and mechanic and aircrew training that will affect the decision also. Currently the HMLA squadrons have the UH-1N and the AH-1W, both Bell products. This allows the use of many common systems. By electing the MLU option vice buying the H-60 the support structure remains in place. Of the 195 pieces of support equipment required for the MLU, 121 are common to the UH-1N. Likewise, many parts will be common and the distribution system the same. (5)

Mechanic training will only need upgrading with the MLU instead of the complete retraining for a new type aircraft. Since the HMLA squadrons have two Bell helicopters, many mechanics are qualified on both aircraft because of common systems. On the other hand, buying a new aircraft might require additional maintenance personnel. Pilot training for a new type aircraft would also be significant. Pilots would have to be retrained to become flight qualified and then continue training until combat qualified. This transition would be at a high cost for schools, fuel, parts and maintenance

manhours just to combat qualify the aircrews. Is the increased capability of the Black Hawk over the UH-1N MLU worth the cost?

The tiltrotor concept will bring a significant leap in technology and capability but there is no guarantee when it will arrive. The V-22 which is to replace the CH-46 must be funded and fully fielded before the VMAO can become a competing priority with other projects. Is 2015 a good guess or just a shot in the dark? There is one remaining question: When can these options be fully fielded? The current POM cycle is for 1996. If Sikorsky was awarded the contract for POM 1996 the first Black Hawk would be introduced in 1998 and fully fielded in 2001. As for the UH-1N MLU, Bell states the helicopter is ready now for evaluation and can upgrade all the USMC Huey's by 1999. If the VMAO is due in 2015 which option is more cost effective? The MLU will have 17 yrs. of service in the fleet while the Black Hawk only 15 yrs. With a service-life of 20 yrs. the H-60 would not be ready for retirement in 2015. This would probably mean the VMAO as a replacement for the utility mission would not occur because of budget conflicts.

When 2015 comes and the VMAO is ready to enter the fleet, opponents may argue that the Black Hawk still has 10 yrs. of useful service-life left and it would be a waste of taxpayers' dollars to retire a good aircraft. This might postpone the VMAO for another 10 yrs. If the MLU will extend the UH-1N service-life another 15 yrs. then it is the proper choice. If, on the other hand, the Marine Corps selects the MLU and in 2015 no VMAO funding is available and the UH-1N MLU is no longer flyable, we will again be forced to apply band-aids to keep it flying. In contrast, by spending the extra dollars now for the H-60 we will receive a capable helicopter with a service-life that will

allow flexibility while waiting for the eventual VMAO arrival. This poses a tough dilemma. Although the logical and most inexpensive choice is to plan on the VMAO in 2015 and purchase the MLU, the safest decision is for the Marine Corps to buy the Black Hawk H-60.

The second reason the UH-1 cannot effectively conduct its mission is because there are not enough aircraft to meet operational tempo. Past table of equipment (T/E) for the HMLA squadrons was 12 UH-1Ns and 12 AH-1s but the planned reorganization will change the T/E to 9 UH-1s and 18 AH-1s. The increase in Cobras addresses the need for more anti-mechanized weapon systems. With only nine Hueys in a squadron there are not enough utility aircraft to fulfill mission demands. On the west coast at Camp Pendleton, Ca., there are three FMF squadrons with a fourth deployed overseas for six months. There is also a training squadron, HMT-303. The HMLAs with a typical T/E will have a total of 27 Hueys. The HMT will have an additional 9 aircraft, which could be used if required, thus 36 utility helos are at Camp Pendleton. This number of helos enables an even and manageable tasking to all the squadrons. On the east coast it is a different story.

At MCAS New River there are only two HMLA squadrons. These provide all the requirements for the Second Marine Division, the Wing and LF6F deployments. The squadrons must also provide training and proficiency flights for their aircrews. According to the T/E the two squadrons combined would have 18 utility helicopters. To see how critical the situation is the aircraft numbers must be broken down. Each squadron alternates in providing personnel and aircraft that will chop to an HMM composite squadron that deploys with a MEU(SOC) in support of the LF6F. An HMLA

will normally chop four AH-1 s and two or three UH-1 s for approximately 12 to 14 months to a HMM squadron. This will occur every year. Therefore, there are always at least two and possibly three UH-1s attached to another HMM squadron. Then prior to their return the HMLA squadron must prepare and chop another detachment for the following LF6F deployment.

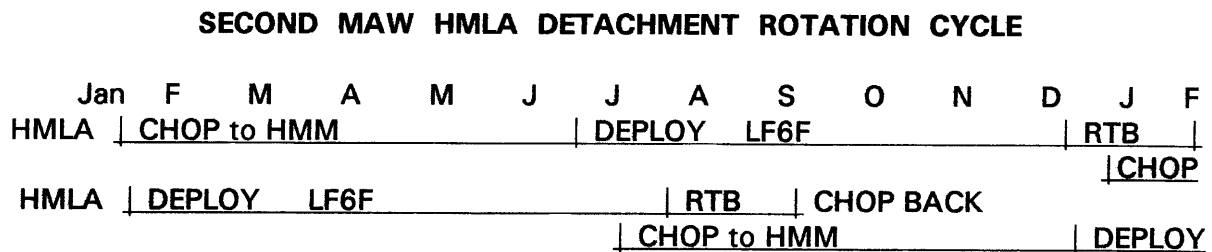


Figure 1

The next detrimental input on aircraft availability is maintenance. As stated earlier the Huey is almost 20 years old and through its life-cycle each aircraft must undergo standard depot level maintenance (SDLM) for inspection and rework. On average this happens every 4 to 5 years depending on flight time on the airframe and overall condition. This maintenance period lasts approximately eight months. That now leaves the squadron with five or six aircraft to fulfill missions generated by higher headquarters and to provide training and proficiency flights to keep the aircrews combat qualified. At the organizational level, a squadron may have 100% aircraft availability under ideal conditions but normally 80% is a good planning estimate. This would drop another aircraft out of the daily schedule.

Squadrons also provide detachments for annual exercises such as Ocean Venture, Teamwork and Combined Arms Exercises (CAX). These exercises last from six to eight

weeks requiring two to three UH-1 s. For a CAX he whole squadron will normally deploy

Table III

A/C AVAILABILITY CHART

LF6F	3
SDLM	1
Maint	1
MAWTS	1
TOTAL	9

to Twentynine Palms. Upon return, because of heavy use during the exercise and transit, most of the aircraft are sent immediately into maintenance and are not available for 3 to 5 days with some aircraft even longer. A unique situation arises when a 2nd MAW HMLA deploys to CAX and then immediately after must support a Marine Aviation Weapons Tactics School (MAWTS) class with four UH-1 s for two months. By the time the squadron arrives home from CAX the returning aircraft, usually the weakest, go into maintenance, often for an extended period. This can leave the squadron without any UH-1s to fly for four to sometimes six weeks. Finally, when the aircraft return home from MAWTS and maintenance is back up to speed the vicious cycle starts again. Considering these availability problems, could the squadron support a short notice contingency plan with two to four UH-1s? Although the HMLA T/E and T/O are designed to support three deployments simultaneously, there may not be enough Hueys.

Another factor to consider is the future missions of the Marine Corps. We have

seen in the last two years the mission for the Marine Corps broadened to include: a major conflict such as SWA; peacemaking/peacekeeping in Somalia; humanitarian relief in Bangladesh; a possible low-intensity conflict (LIC) in some Third World country; and participation in counter-drug operations. What demand will these roles have for a utility helicopter? Are there enough UH-1s to fulfill all the requirements?

The UH-1 was one of the many unsung heroes of Desert Storm. Major Steve Jones, a MAWTS instructor wrote:

That the utility helicopter was a vital part of DESERT SHIELD/DESERT STORM is without question. Every HMLA and HML (Reserve) unit in the Marine Corps either deployed to SWA or was assigned another regional contingency. In fact so in demand were UH-1s in SWA that the existing HMLA squadron configuration of 12 UH-1s was not adequate to support all of the operational requirements commanders had for these aircraft. The Reserve squadrons luckily were able to provide the additional aircraft and crews needed to meet the increased requirements of the situation. Daily tasking and operational tempo continued to rise for the HMLA squadrons during the course of the war, demonstrating an increasing requirement for utility support within the MAGTF. (2:52)

In a low intensity conflict a MEU (SOC) may be tasked to conduct support operations. Many of the exercises the HMLAs annually provide support to have LIC scenarios. Although scenarios differ with each exercise the composite helicopter training varies little. During Teamwork 92, HMM-263 deployed to Norway as the composite helicopter squadron. The ACE afloat consisted of HMM-263, which included two UH-1Ns, on a LPH and the Harrier squadron on a LHA. SAR was provided by the Navy with two SH-3s on the LPH and one UH-1 on the LHA. During the transit the amphibious ready group encountered bad weather and high seas and was forced to take two separate routes. One Marine UH-1 was transferred to the LHA to support SAR with plans to rejoin the helicopter squadron upon entering the amphibious operation area. At this time the second UH-1 was down for maintenance awaiting a part from CONUS. Upon

entering the fjords of Norway the Huey returned and went down for maintenance for three days. The other Huey came up but was immediately tasked to support the MAGTF commander for the duration of the exercise and was sent to the LHA. Ironically this Huey was down for maintenance for most of the exercise. Back on the LPH the one Huey which was to support the regimental landing team (RLT) was also down and missed the first three days of the assault. It became obvious that a third Huey would have provided the necessary depth to support the operation.

The latest operation the Marine Corps has been involved in is peacemaking in Somalia for Operation Restore Hope. To support the MAGTF the Huey is proving its full versatility from command and control and support missions during the initial assault to a variety of utility roles as the situation calms. The Huey conducts vital sorties such as armed reconnaissance of highways to determine trafficability and assess possible threats then returns to escort the relief convoys to their destinations. In situations involving significant distances and poor communications, the Huey is used for courier missions.

Considering the lack of aerial imagery collection platforms in the MAGTF, the Huey can be used to fly combat photographers to identify and photograph arms caches and gang headquarters. The digital cameras used can develop a print on the spot. The Huey can then land at the tactical commander's location and provide real-time intelligence. Another mission, although not deemed tactical, is VIP transport. In a situation like Somalia political visibility is high. Support for visiting delegations becomes a priority. Two and often three helicopters are dedicated to support them for a full day, possibly two. Again the commander cannot afford to waste valuable CH-53s

and CH-46s to move 200-400 lbs of cargo and one or two people, so the Huey is tasked.

In humanitarian relief operations, as during Operation Sea Angel in Bangladesh and Provide Comfort in northern Iraq, emphasis will be on logistical support. The CH-53 will take the burden, supported by CH-46s. Here again the UH-1 will be indispensable in the utility role, transporting medical teams, conducting SAR and carrying light cargo. Using valuable transports for the numerous simple missions would waste limited assets.

Are there enough UH-1s in a deployed MEU to fulfill demand? NO. The ACE must be able to support all the versatile and demanding missions required of the MEU (SOC). If the threat is high, the Cobras will be expected to perform in an anti-mechanized role. With only four AH-1s per MEU and with one usually down for maintenance, there will only be three available for an operation. To ensure sufficient CIFS coverage a UH-1 will be sent to complete the second section of gunships. This leaves one UH-1 left to fill the command and control role and any other add-on missions. This is betting on 100% availability. To fulfill the demand of a MEU(SOC), the T/E must be increased to a minimum of 3 UH-1s and ideally 4.

Where does this all leave the squadron? With the additional Hueys attached to the MEU the squadron will have only four Hueys to support assigned missions and the essential training to keep the aircrews current. The typical pilot T/O excluding the detached pilots is 26. These pilots must share the remaining four aircraft. Many of the missions tasked by the Division and Wing are routine and afford only limited training. Training assets to hone skills like night vision goggles, air combat maneuvers and ordnance delivery are severely limited. These are highly perishable skills. At times

flying is referred to as being similar to riding a bicycle: it comes back quickly, but not so with these skills. No matter how much experience a pilot has, he must perform these missions frequently or his expertise level drops quickly. Couple these critical skills with missions like hovering at 50ft. for 20 minutes to recover a downed pilot in the trees; a highspeed low-level approach into a zone to fast-rope a recon team; or night confined area landings and shipboard landings. Then step this up with two or three helicopter tactics and the essential skills to be a proficient utility helicopter pilot become vast indeed. A typical UH-1 pilot may only perform a specific mission but once in 3 or 4 months, yet he is considered qualified and expected to perform it with expertise. This all comes back to aircraft availability. The HMLA squadrons must retain 12 UH-1Ns.

So the cycle goes on and the frustration is felt most at the unit level. The pilots cannot remain proficient at their required tasks and the small unit leader is deprived of a valuable asset. We all realize the immediate future will bring budget restraints and stiff competition for project funding. Publicity follows the high-tech and glorified roles of the F-18, the Harrier or the Cobra attack helicopter. Consequently, projects like the UH-1 seldom reach the top priority list. However, one fact is clear, the Huey will not last another 20 years, so a decision must be made soon and the project actively pursued.

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5. UH-1N Mid-life Upgrade (MLU). Pamphlet published by Bell Helicopter Textron.
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6. UH-1N NATOPS Flight Manual, NAVAIR 01-110HCE-1, 1 March 88. take the burden,
supported by CH-46s. Here again the UH-1 will be indispensable