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FLIGHTfax

Army Aviation Composite Risk Management Information

Rescue "Turned Bad"

plus own the EDGE Composite Risk Management pull-out posters

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FLIGHTfax

Army Aviation Composite Risk Management Information

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DASAF'S CORNER

From the Director of Army Safety

I'm Bill Forrester. On August 25, I assumed command of the U.S. Army Combat Readiness Center and the responsibilities as your Director of Army Safety. It is my distinct honor and privilege. The team at the USACRC is committed and passionate in doing whatever it takes to preserve our combat power.

Initial burst of my thoughts in my short time are in three areas.

• **Individual.** We say the Army Safety Risk Management Information System is a winner. To date, there are five recorded deaths in the 1.3 million uses. Not only does the program give solid information to the user, it provides a built-in opportunity for the first-line supervisor to engage. This is a low-pain, high-gain initiative. So, what about the other 100-plus Soldiers who were killed and didn't use ASMIS-2?

• **Unit.** The Army Readiness Assessment Program is a Web-based initiative that provides battalion-level commanders with data on their formation's readiness posture. Consider Army units scoring in the bottom 25 percent are four times more likely than the top 25 percent to experience a Class A mishap, and the cost of lost equipment is 14 times greater than units scoring in the top 25 percent. ARAP is big bang for the bucks, yet enrollments are soft and completions softer.

• **Army.** We say that accidental deaths are down about 20 percent from last year's tally. Yet, we are still 250 percent above our directed goal when using Fiscal Year 2002 as the baseline for a 50 percent reduction. We are not winning yet, and there is clearly much work required.

So, what do we know?

We know our Warriors live and operate on the leading edge, but they should not be alone on the Edge. Leaders must be there, engaged and accountable. Leaders must stay engaged. We must lead on the edge. There is no

WILLIAM FORRESTER
Brigadier General, U.S. Army
Commanding

"WE KNOW OUR WARRIORS LIVE AND OPERATE ON THE LEADING EDGE, BUT THEY SHOULD NOT BE ALONE ON THE EDGE. LEADERS MUST BE THERE, ENGAGED AND ACCOUNTABLE."

such thing as an anonymous leader. Leaders commit.

We know accountable leaders, engaged at the correct/appropriate echelon, immediately save lives and promote change in our Soldiers' culture, instinct and intuition for our future. Consider during the rise in motorcycle deaths this fiscal year, two-thirds of the 45 fatalities were sergeants and above. It is not just specialists who require or deserve engaged and accountable leaders.

We know Preliminary Loss Reports clearly reveal preventable mishaps where engaged leaders could have made a difference. Someone always knows when a platoon member has just bought a motorcycle but never completed required training; someone knows when an aviator's reputation is to *cowboy* aircraft; someone knows when Soldiers routinely fail to buckle up when driving. Someone knows and should engage.

Our job as leaders and Soldiers is to ENGAGE! Engage at the lowest level. The tools are there and we only get the Soldiers we have now. There is no strategic reserve we can call up when the ones we have are dead. We know we "Never Leave a Fallen Comrade."

Please let the USACRC know how we can improve to preserve, maintain and improve our Army.

Leading on the Edge — Own the Edge.

WILLIAM H. FORRESTER
BRIGADIER GENERAL, U.S. ARMY
COMMANDING

Investigators' Forum

ACCIDENT INVESTIGATION DIVISION
U.S. ARMY COMBAT READINESS CENTER

RESCUE TURNED BAD

The squad was engaged in an intense firefight that resulted in several casualties. After the enemy was beaten back, it was time to triage the injured and assess the evacuation requirements. It was quickly determined the seriousness of the injuries and the remoteness of the pickup sight mandated an urgent nine-line MEDEVAC call be made to evacuate the most severely injured.

WHEN THE LOAD WAS ABOUT NINE FEET BELOW THE AIRCRAFT, THE CABLE SNAPPED, DROPPING THE PATIENT AND MEDIC TO THE ROCKY TERRAIN ABOUT 30 FEET BELOW. BOTH THE PATIENT AND MEDIC SUFFERED FATAL INJURIES IN THE FALL.

The call was sent out and the aircraft quickly responded to the engagement area. The pilot's assessment of the sight indicated a hoist lift would be required to extract the injured from a steep ravine. However, the operation presented several challenges—the first being the temperature and terrain were both so high the aircraft did not have sufficient power for an out-of-ground effect hover. Other challenges involved operating the hoist under night vision goggles while confronting enemy threat.

As the crew reconned the area, a number of explosions reminded them this was still a hot area. Because the enemy remained near the pickup zone, the crew wanted to minimize the flight altitude and exposure time to enemy fire. The crew decided upon a low-hover hoist lift, but it would be complicated by the steep cliffs and obstacles that prevented the crew from maneuvering directly over the injured patient. Moving the patients to a better site would also have been extremely difficult because of the ruggedness of the terrain and the severity of the injuries.

The problem of insufficient power was resolved by burning off fuel and off-loading internal weight until the aircraft gross weight was within OGE hover weight limits. However, the problem of insufficient room to hover directly over the patient, while allowing a mask from the enemy threat, proved more difficult to solve. In the end, the problem was solved by accepting a 10-foot lateral offset from the patient's position during the hoist operations. The crew believed any load swing

Written by accident investigators to provide major lessons learned from recent centralized accident investigations.

Despite the best efforts of the crew chief, the hoist cable swing could not be arrested, and the cable rubbed against the side of the aircraft during load oscillations.

from this offset could be arrested before the load was lifted onto the aircraft.

The first hoist operation went well with a successful lowering of the flight medic and the subsequent hoisting of the first patient with the medic onto the aircraft. The second hoist involved the most severely injured patient. As the second hoist began, the cable started to swing wildly. Despite the best efforts of the crew chief, the hoist cable swing could not be arrested, and the cable rubbed against the side of the aircraft during load oscillations. The aircrew attempted to lower the load, but the terrain was too hazardous and the load continued to swing uncontrollably. After the failed effort to lower the load, the crew chief attempted to continue the hoisting operation. As the load was lifted, the cable continued to contact the side of the aircraft. When the load was about nine feet below the aircraft, the cable snapped, dropping the patient and medic to the rocky terrain about 30 feet below. Both the patient and medic suffered fatal injuries in the fall.

LESSONS LEARNED

The post-accident investigation of the hoist cable revealed several cable strands were broken at different points along the cable. This compromise of the cable integrity occurred when it contacted the side of the aircraft. During the oscillations, the hoist cable rubbed against the cargo door track, creating a sharp and serrated edge. As the cable continued to contact the sharpened door track, the cable's outer sheath was cut, weakening the cable to the point that it could no longer support the load.

As with any accident, there are hard lessons to be learned from the loss of these two brave Soldiers. A review of the hoist system and aircraft maintenance records did not reveal any significant maintenance anomalies that contributed to the accident. Technical Manual 1-1520-237-10, *Operator's Manual for UH-60A Helicopter, UH-60L Helicopter, EH-60A Helicopter,* has a warning in chapter 4 (para 4.18.6) that emphasizes the importance of keeping the hoist cable from contacting the side of the aircraft. During the accident sequence, this effort was complicated by the initial load lift being off center and the fact there were two Soldiers on the hoist at the same time. This combination of factors made it very difficult to arrest the oscillations quickly. The rugged terrain and enemy situation made setting the load back down a difficult and potentially dangerous option.

There is a recent addition to the MEDEVAC UH-60 rescue hoist "A Kit" modification. This new modification includes a hoist cable guard over the cargo door track currently installed as part of a Retrofit Service Notification No. 1001031. This hoist cable guard reduces the chance of a cable shear if the cable contacts the door track. The hoist cable shield is clearly an asset in maintaining the serviceability of the cable during a difficult hoist operation.

This accident illustrates how difficult Composite Risk Management can be on the battlefield. Proper management of accidental risk and enemy threat is often a difficult and poorly illuminated path. The challenge we all face is to train to the point where we can see through the haze and develop the best chance solution that addresses both threats. ♦

—Comments regarding this article may be directed to the U.S. Army Combat Readiness Center Help Desk at (334) 255-1390, DSN 558-1390, or by e-mail at helpdesk@crc.army.mil. The Accident Investigation Division may be reached through USACRC Operations at (334) 255-3410, DSN 558-3410, or by e-mail at operationssupport@crc.army.mil.

Editor's Note: These photos are representative of the accident aircraft.

This accident illustrates how difficult Composite Risk Management can be on the battlefield. Proper management of accidental risk and enemy threat is a challenge all leaders face. Whether in combat, training, or just blowing off steam, leaders need to be involved in identifying risks for each Soldier. With leader involvement, Soldiers can know where the edge is … by applying CRM, they can Own It!

TAKE ALL HAZARDS INTO ACCOUNT

ACCIDENT INVESTIGATION DIVISION
U.S. ARMY COMBAT READINESS CENTER

Only someone who's been there actually knows the relief when you finally hear a "bird" coming to pick you up from some remote, hostile locale. Unfortunately, the 10 good Soldiers in this accident thought they were leaving the worst behind them, but it took only one broken tree and a few seconds for disaster to strike.

The Soldiers had experienced three weeks of hard fighting in the rugged mountains of central Afghanistan and they were ready to get out of there. A CH-47 Chinook was scheduled to extract the Soldiers from their remote observation points at night—a decision that concerned the unit's Non-Commissioned Officer in Charge.

The NCOIC was relieved his men were getting a well-deserved break, but he was concerned about using OP Alpha for a night extraction. The area was marked by several trees and littered with loose debris and trash from the unit's time spent there. To make matters worse, the helicopter landing zone on OP Alpha was big enough for only the CH-47's rear two wheels to touch the ground. The aircraft's nose would remain in the air over a steep cliff, and all these factors together made for one tough mission at night. Other CH-47s had landed at the HLZ before, but only in the daylight; even then, there were a few tense moments because of the tight fit.

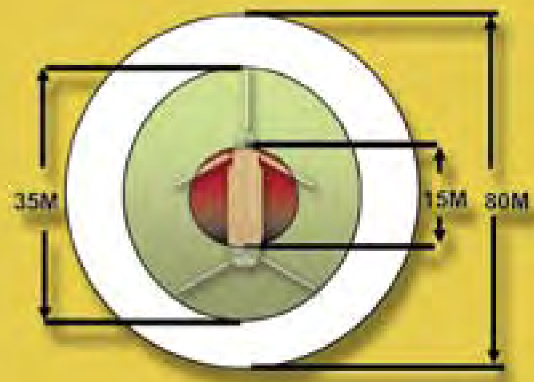
The NCOIC recognized the difficult circumstances and surveyed the area to see if anything could be done to help ensure a safe outcome. He directed a team to pack up and position the unit's equipment on the HLZ to facilitate rapid loading. The other NCOs supervised the collection and burning of the trash and debris. The NCOIC then tried to tackle the tree problem. He wasn't sure of the CH-47's exact clearance requirements, but he felt certain that if at least one of the HLZ's two trees were cut down the pilots would have an easier time maneuvering the aircraft in the small area at night. He tasked a couple of his subordinates to cut down what he thought was the most problematic tree.

This job proved easier said than done. The tasked Soldiers couldn't find an axe, machete or tree saw on the remote OP. They found a pick, hammer and k-bar knife, though, and running short on time, they did what most Soldiers would do—they worked with what they had with all the hooah they could muster. They began hacking at the foot-wide tree trunk with the knife at a feverish pace, but after several hours they were exhausted and had cut only halfway through the tree. The Soldiers were out of time and short on water, so they finished up the other preparations and marked the HLZ.

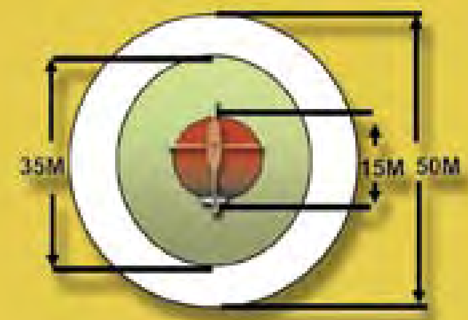
The Soldiers marked the obstacles with small chem lights, which they placed slightly above the ground for better visibility. The HLZ was narrow and there wasn't room for a full inverted-Y, so the Soldiers secured two large chem lights on the ground near where the aircraft's rear tires were to touch down. Only minutes after the final checks were conducted, the inbound CH-47 called the primary zone control and announced they were two kilometers out from landing.

Figure 1:
The following is an illustration of dimensions of three zones as it applies to each landing point, by type, intended to be used.

Note: Measurements are in meters.



Landing surface clear zones for CH-47



Landing surface clear zones for UH-60 & AH-64

The aircraft made a couple of missed approaches before the pilots successfully executed the difficult backing approach onto the small landing area. The 70-foot gap between the trees allowed only four to five feet of rotor clearance on both sides of the aircraft. But despite these challenges, the initial passenger and equipment loading went as planned.

About 45 seconds after landing, the first of the accident's chain of events happened. The aircrew saw some small, glowing spots directly below the aircraft's nose and apparently thought they were taking enemy fire. They made a hasty departure off the HLZ with only a portion of their planned passengers and cargo. The aircrew soon discovered the spots were merely burning embers from the trash pit just to their side; the aircraft's rotor wash had stoked the burn pit and caused the embers to fly through the air. Some Soldiers covered the burn pit with dirt, and the CH-47 crew attempted another approach to pick up the rest of the passengers and cargo.

On this last approach, the CH-47's rear rotor disk contacted the tree on the left side of the HLZ. The aircrew attempted an emergency departure, but the rear rotor system collapsed five seconds after the initial tree strike. Tragically, the aircraft crashed on the nearby cliff and was consumed by a post-crash fire, killing all 10 Soldiers onboard.

A Marine platoon arrived at the HLZ soon after the accident to provide security. They saw the partially chopped tree and, realizing it would be in the way of the aircraft that would come get them, started taking the tree down with a tree saw. Within 10 minutes they'd finished the job the ill-equipped Soldiers had started earlier that day. They then walked down the cliff to assist in recovering the deceased Soldiers' remains from the crashed aircraft.

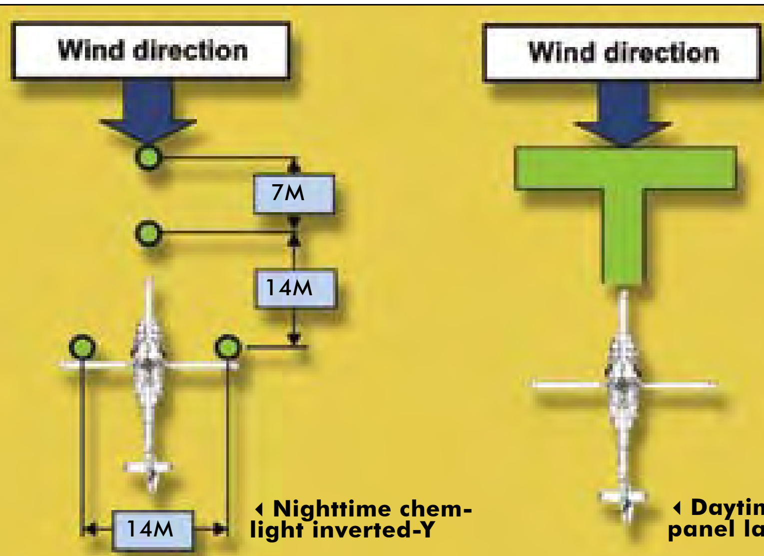
LESSONS LEARNED

The aircraft pilot in command is generally regarded as the final authority on HLZ suitability, but it's the whole team's responsibility—from private to commanding officer—to exercise Composite Risk Management to minimize overall risk. We must apply the hard-learned lessons from this accident to future combat operations; after all, our ground troops rely heavily on our aircraft to get them in and out of places vehicles can't go.

HLZ preparation might seem like a small part of the big picture, but it plays a huge role in the CRM process for troops operating in remote areas. Just because an HLZ begins as an unimproved area doesn't mean it has to remain so. No Soldier tasked with HLZ preparation should be lulled into a false sense of security, even if an aircrew has managed to "squeeze in there" a time or two. No two pilots are alike, and no two missions are the same. What might be a fairly simple daytime landing for an experienced aircrew can be extremely challenging for a junior crew facing high winds, heavy sling loads or low-illumination night operations. The goal of combat HLZ preparation is to maximize the chances of success in even the most challenging high-threat conditions, not simply do enough to get by and hope for the best.

There are a number of simple steps and resources Soldiers and leaders can use when preparing combat HLZs. Two good

Figure 2: For both the chem-light inverted-Y and the VS-17 landing-T, ensure they are secured well enough to withstand 100-mph winds from main rotor downwash.



Nighttime chem-light inverted-Y

Daytime VS-17 panel landing-T

references are Field Manual 10-450-3, *Multi-service Helicopter Sling Load: Basic Operations and Equipment,* and the recently updated FM 3-21.38, *Pathfinders Operations,* both of which address the essentials of HLZ operations. The most basic task is landing site selection, which is based on a number of tactical and safety factors including:

• **Security and concealment.** Landing sites should be shielded from the enemy as much as possible and offer good masking terrain on the approach and departure paths.

• **Convenience.** Landing sites should be situated in areas that limit the ground movement of cargo and troops as much as possible.

• **Slope.** Helicopters have a varied tolerance for landing on slopes, depending on the aircraft type and wind conditions. As a general rule, the less slope on the landing surface the better; but a seven-degree maximum slope on the landing surface is a good figure for planning. A global positioning system is a great tool for establishing the distance and gradient of slopes. Downslope landings should be avoided because most aircraft have an extremely low tolerance for landing with the nose pointed down. Additionally, passengers and cargo should never be loaded from the upslope side because the steeper the slope, the closer the rotor system is to the ground.

• **Surface suitability.** Sod, hardstand, rock or packed earth are the preferred landing surfaces for Army helicopters. Dusty surfaces should be avoided whenever possible.

• **Obstacle clearance and size.** The HLZ must have an obstacle-free approach path (i.e., clear of tall wires and unlit towers) and suitably large obstacle-free zones to accommodate the type and number of aircraft using the HLZ. FM 10-450-3 and FM 3-21.38 define the parameters for the three zones (red, green and white) required at every HLZ (figure 1). If more than one aircraft is scheduled to land in the HLZ, each helicopter must have its own obstacle-free zones.

• **Marking and signaling.** A number of marking and signaling devices and techniques are available, but the most basic landing systems are the inverted-Y for nighttime landings and the VS-17 landing-T for daytime missions. The marking materials must be secured to withstand winds greater than 100 mph from the aircraft's rotor wash (figure 2).

CONCLUSION

Ground troops and aviators have to work together to ensure the safety of all in the hectic and dangerous world of combat operations. Neither our ground nor air forces are fighting in ideal conditions, so cooperation between the two is vital to everyone's survival. The 10 good Soldiers we lost in this accident thought they were leaving the worst behind them, but it took only one broken tree and a few seconds for disaster to strike. Use CRM and take into account all the hazards your unit will face in combat, including those posed when the "freedom bird" lands. ♦

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Are You at the End of Your Rope?

CHRIS TRUMBLE
U.S. ARMY COMBAT READINESS CENTER

Helicopter lifting operations are a frequently performed and critical task. Safety during these operations is paramount. The pilot may perform his part perfectly and the crewmember may operate the hoist in the most professional manner; however, if the hoist or cable fails, a tragic accident can result, as seen in the accident review in this issue of *Flightfax*.

Whether it involves a medical Skedco litter hoist (figure 1) or rescue down-the-wire hoist operation, the hoist *must* operate efficiently and safely. Composite Risk Management can be applied to reduce hoist failures. Some CRM considerations in hoist operations include training, equipment inspection and the area of operation.

TRAINING

All hoist operation missions are not equal. Performing a night hoist mission differs from performing a day hoist mission. A rescue down-the-wire mission is different from a litter lift mission. From the training perspective, consider whether the crewmembers are qualified for the anticipated hoist mission. Have they completed a sufficient number of training and rehearsal missions to safely complete the task? Is the hoist operator familiar with the proper use of taglines? These are just a few of the many questions concerning the level of crew competency that needs to be considered in applying CRM to hoisting missions.

Emergency procedures need to be trained for each possible situation (night, overwater, etc.) given, and how these procedures require modification for peace operations versus combat operations. Consider reviewing historical hoist accidents in an effort to identify potential malfunctions and develop hoist emergency procedures to respond to similar instances. Don't just focus on Army or combat accidents; focus on research-related incidents from other users who perform hoist operations such as foreign militaries, Marine Corps or civilian rescue agencies. We are foolish not to learn from the often costly lessons learned by others involved in accidents whether they are Soldiers, Marines or civilians.

EQUIPMENT INSPECTION

Operational performance checks and preventive maintenance checks and services need to be performed as per unit standing operating procedures and the technical manual that applies to the equipment used. Incorporating some of the PMCS items into an operational performance checklist could help in keeping hoisting equipment operating at peak efficiency. Key frame areas, lubrication fittings and electrical/hydraulic connections could all be included on the operational performance checklist. Also, be sure to check operating functions such as speed of lift, stopping distance and motor temperature. Anything unusual should be reported to maintenance. The performance of these features usually deteriorates over time. An operator typically will adjust to compensate for the decrease in performance level. By compensating and not notifying maintenance of degraded performance, the system could deteriorate to the point of

FIGURE 1. Skedco litter

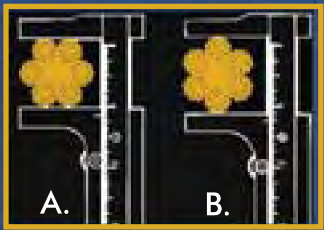

FIGURE 2. Measuring wire rope diameter
A. Incorrect
B. Correct

FIGURE 3. Example of "bird cage" defect

FIGURE 4. Example of broken wire strands

requiring replacement rather than repair.

Hoists often use wire rope, and knowledge of wire rope basics is advantageous to understanding the importance of using the manufacturer-specified wire rope in the hoist rather than substituting. Wire rope size is determined by its diameter (figure 2). The strength of a wire rope is a function of its size, grade and method of fabrication. The individual wires that comprise the rope may be made of various materials. The weight of the rope is dependant upon the rope's size and method of construction. The maximum strength of a wire rope is its breaking strength. For safety reasons, you do not want to load a wire rope anywhere near its maximum strength, so a suitable margin of safety is provided through specifying a maximum working load. The maximum working load rating is determined by dividing the rope's ultimate strength by an appropriate safety factor. This working load rating is calculated by the manufacturer.

Desirable wire rope characteristics can be obtained for specific purposes by varying wire and strand combinations. By using smaller and more numerous wires, the more flexible the rope becomes. However, this results in less resistance to external abrasion. Wire rope constructed of a smaller number of larger wires gains resistance to external abrasion but loses flexibility. Obviously, any wire rope will not do for all hoisting operations, and the hoist manufacturer must select or have designed a wire rope according to the purpose for which the hoist is intended. Your safety responsibility is to ensure the appropriate wire rope is being used with the hoist in question.

Wire rope should be inspected as per the TM for the equipment. However, there are some general signs of trouble to be aware of. Any of the following indicates the cable should not be used:

- Any evidence of a sharp permanent bend or kink in the cable that is caused by a loop in the cable being pulled up tight.
- Bird caging of the wire rope results from stretching or untwisting of the outer wraps of wire strands (figure 3).
- If the winch drum is misaligned flat spots and/or worn or abraded localized sections can be

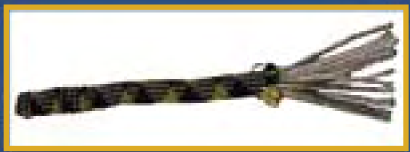

FIGURE 5. Kernmantle rope

KERNMANTLE ROPE INSPECTION

The core of the kernmantle rope cannot be seen, and it's possible to damage the core without damaging the sheath. Damage to the core usually consists of filaments or yarn breakage resulting in a slight retraction. If enough strands rupture, a depression or localized reduction results in the diameter of the rope that can be felt and sometimes observed.

Check a kernmantle rope by inspecting the sheath before and after use while coiling the rope. Note how the rope feels as it runs through the hands and tie off any lumps or depressions felt.

Check any suspected areas further by putting them under tension. This procedure will emphasize any depression by separating the broken strands, resulting in an enlarged depression. If a noticeable difference in diameter is obvious, retire the rope immediately.

FIGURE 6.
Locking and non-locking snap links.

The following inspection findings are reasons to suspect the snap link's structural integrity:

- -Corrosion.
- -Signs of body or gate being nicked or deeply scratched.
- -The locking gate does not function properly.
- -Identify the manufacturer of the snap link and ensure no recalls have been issued.
- -Distorted body shape indicates potential history of overloading.
- -Plating cracked or peeling.
- -Rough pivoting action of the gate.
- -Loose or damaged gate cross pins.
- -Spring and paddle improper function and/or damaged or contains foreign material.
- -Cracks in the gate tabs radiating out from the pin hole to the edge of the tab.

evident on outer wire strands, the winch drum should be aligned and the wire rope replaced.

• Any signs of broken wire rope strands are indications the rope should be replaced (figure 4).

Don't neglect inspecting ancillary equipment such as weak links, taglines and snap links (carabiners). A new weak link must be used for each live hoist mission. Perform the task to standard and do not reuse weak links for live hoist missions. If the task specifies a 250-foot minimum length of three-eighths-inch Kernmantle nylon rope (figure 5) for a tagline, ensure you're complying and inspect the line for any defects before use. Snap links (figure 6) should be inspected for defects and to ensure they are properly rated for the task.

AREA OF OPERATION

The mission AO is an important consideration when applying CRM to hoisting tasks. Specific weather conditions can cause fogging or misting of goggles or visors and adversely affect your ability to operate the hoist or observe hoisting. Cold weather can affect your manual dexterity and reduce your hand's ability to manipulate hoist controls or cable hooks. Consideration as to what extent you can sacrifice comfort for dexterity will have to be determined while maximizing safety. The hoist operator vest is susceptible to attack from materials such as hydraulic fluid, grease, oil or acids and result in degradation of the vest's physical strength. These are a few of the environmental and geographical considerations which could comprise the mission AO that CRM should be applied. Own the Edge! ♦

Author's note: This information is provided as a basic general overview primarily due to the limited space necessary to cover this topic in detail. Also tactics, techniques and procedures involving specific night operations have not been discussed in detail to protect classified information and operational security. Soldiers can access and review the below list of various manuals and bulletins available for additional information on this topic.

—For more information, contact the author via e-mail at christopher.trumble@crc.army.mil.

ADDITIONAL SOURCES OF INFORMATION:

-ARTEP 1-245-MTP Mission Training Plan for the Heavy Helicopter Battalion
-ARTEP 8-279-30-MTP Mission Training Plan for the Medical Company (Air Ambulance) (September 2002)
-FM 3-04.500(1-500) Army Aviation Maintenance (26 Sept 2000)
-FM 5-125 Rigging Techniques, Procedures, and Applications (23 February 2001)
-FM 8-10-6 Medical Evacuation in a Theater of Operations (14 April 2000)
-FM 8-15 Medical Support in Divisions, Separate Brigade, and Armored Cavalry Regiment
-29 CFR 1926.251 Rigging Equipment for Material Handling
-29 CFR 1910.184 Slings
-TB 1-1520-240-20-108 All H-47, One Time and Recurring Inspection of Hoist/Cargo Hook Control Panel and Water Intrusion in the Cockpit (5 March 1999)
-TC 1-204 Night Flight Techniques and Procedures (27 December 1988)
-TC 1-211 Aircrew Training Manual Utility Helicopter, UH-1 (9 December 1992)
-TC 1-237 Aircrew Training Manual Utility Helicopter H-60 Series (27 September 2005)
-TC 1-240 Aircrew Training Manual Cargo Helicopter, CH-47D (September 2005)
-TM 55-4240-284-12&P Operating and Maintenance Manual for Rescue Seat, Forest Penetrating (NSN 4240-00-199-7353), Including Repair Parts and Special Tools List
-TM 55-1680-320-23&P High Performance Rescue Hoist Assembly

H_2O Hazard

CW2 JESSE O. ANDERSON
A COMPANY, 2-10 AVIATION REGIMENT
FORT DRUM, N.Y.

It was a routine day mission. We were transporting troops from one landing zone to another in the bustling city of Mosul in the middle of a glorious, full-blown Iraqi summer. With temperatures reaching 130 F, dehydration was an apparent enemy that must be dealt with. Crewmembers normally packed coolers full of frozen plastic water bottles onboard the UH-60 Black Hawk in hopes of having a semi-cool drink throughout the course of a common five- to seven-hour mission flight. This day was no different … until one of those bottles became a potential ingredient in a recipe for disaster.

After a passenger exchange, we prepared for takeoff from a very tight landing zone surrounded by trees. Following our before takeoff check, we climbed altitude over airspeed to depart for our next destination when, at about 20 feet above ground level, the instructor pilot on the controls mentioned some binding in the collective and began to abort the takeoff. I looked down immediately and saw my 1.5-liter plastic water bottle nestled directly on top of the collective, which I promptly removed. On this day an accident had been averted, and upon the end of the mission, I was properly counseled of my error.

LESSON LEARNED

You are responsible for any object you bring in the cockpit. All items deserve proper attention when it comes to aircraft safety, regardless of the size or relevance of the mission. The water bottle that caused my dilemma was only about one-fifth full and lightweight, yet it was still a threat. After that experience, it is easy to see how a water bottle, full or empty, could pose a threat in the cockpit, including getting stuck in the pedals, collective or under a seat, where it may compromise the seat to properly stroke.

Possible solutions include storing water bottles in the cabin, where they can be secured properly. A CamelBak® water system is another option. The CamelBak® became the item of choice by our company's crewmembers as the summer wore on; however, they are not foolproof. Each aviator has the individual responsibility to find the safest mounting location that doesn't interfere with air craft operations, seat belts, seat adjustment, access to first aid kits, etc. As a long-term solution, I recommend the U.S. Army Aviation Warfighting Center at Fort Rucker, Ala., contract the U.S. Army Soldier Systems Center at Natick, Mass., to come up with a more permanent hydration solution that is safely compatible with Army Aviation. ♦

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Maintenance Techniques, the P4T3(S) Methodology

THOMAS JACKSON, CW4 RETIRED

Is maintenance really a commonsense process? Junior leaders who often lack a basic understanding of maintenance operations are required to check maintenance work and supervise maintenance operations.

For many years, the aviation community has taught leaders a simple, commonsense approach to maintenance management called the P4T2 method. P4T2 stands for problem, people, parts, plan, tools and time. The original P4T2 was based upon the thoughts of LTC (now GEN and Vice Chief of Staff, Army) Richard Cody. Updating the acronym to P4T3, the third "T" for training, can verify that work can be accomplished rather than assumed. A step further, P4T3S, the "S" for supervision, provides for the responsible person who has the overall command guidance and responsibility to ensure maintenance success.

PROBLEM

Have we identified all of the problems and faults? Diagnosing the fault using established troubleshooting procedures is the first task the crew and maintenance personnel must complete to standard, particularly during unscheduled maintenance. Disciplined use of technical manuals and adherence to troubleshooting procedures are critical. Incorrect diagnosis at the start of maintenance can waste time, money and repair parts. If the maintainers cannot diagnose the problem, experts should be involved early. Direct support maintenance personnel or logistics assistance representatives can aid in the troubleshooting process.

PEOPLE

Do we have the right people to do the job? To conduct maintenance properly, the right type and number of people are required. The platoon leaders, platoon sergeants and section sergeants are responsible for ensuring maintenance operations are supervised properly. This supervision includes personnel in technical military occupational specialties who are called in for specific jobs or repairs. Commanders and first sergeants must continually manage the use of low-density MOS Soldiers to ensure they are performing jobs requiring their technical skills instead of working on non-job-related details or duties. The battalion/squadron executive officer, company maintenance officer and battalion/squadron maintenance officer must check daily to make sure each function is being managed by the correct level of supervision.

PARTS

Do we have all of the right parts to finish the job? Having the right parts on hand is important to completing any repair job or service. Junior leaders must ensure the right parts are on order if they are not on hand in the battalion/squadron's prescribed load list. For aircraft, the Unit Level Logistics System-Aviation transfer disks and proper ordering is paramount by the tech supply sections. Are supervisors following up with document reconciliations? For ground elements, the proper flow of Department of the Army Form 5988-E, *Equipment Maintenance and Inspection Worksheet,* is essential to this process and requires strict enforcement. Platoon sergeants must verify and report deadlined equipment to the maintenance team. This team must verify all faults, order the right parts by referring to up-to-date TMs and deliver the 5988-Es to the ULLS clerks for action. After the ULLS clerks order and return the 5988-Es, the platoon leaders must check them for accuracy. Mechanics and crews must tag and store serviceable parts taken off all equipment during maintenance to make sure the parts are on hand and serviceable when it is time to put them back on. Don't take for granted that all required parts are on hand. Verify the necessary bench stock and replacement components are available.

TIME MANAGEMENT IS CRITICAL IN MAINTENANCE OPERATIONS. LEADERS MUST ALLOW ADEQUATE TIME FOR MAINTAINERS TO WORK ON THE EQUIPMENT.

P4T3(S)

PROBLEM, PEOPLE, PARTS, PLAN, TOOLS, TIME, TRAINING AND SUPERVISION

PLAN

What is the plan for doing the job from start to finish? Commanders, junior leaders and supervisors must enforce a rigorous, thorough maintenance plan. The maintenance plan for scheduled services must contain adequate details to ensure uniformity. The unit standing operating procedure and maintenance plan are the first steps toward ensuring a solid basis for quality control. Planning for unscheduled maintenance takes place after the fault is identified. This planning is conducted like any other battle drill. Together, the platoon leaders and company/troop maintenance team must quickly identify the resources needed to do the job. Junior leaders can start the planning process by asking all of the P4T3 questions.

TOOLS

Do we have the right tools to do the job? Supervisors must identify the tools required to do the job and make sure they are on hand and serviceable. Using the wrong tools only wastes time and can result in injury to mechanics or additional damage to equipment. Junior leaders must educate themselves on the different tools and enforce TM standards. What about calibration requirements? Are torque wrenches and special tools within specifications? Are all DA Label 80 (calibration) items labeled and current? Is our unit test measurement diagnostic equipment program within standards?

TIME

How long is the job going to take? The estimated completion date of maintenance that will bring an aircraft or vehicle to fully mission capable status is extremely important in forecasting combat power within a battalion/squadron. Time management is critical in maintenance operations. Leaders must allow adequate time for maintainers to work on the equipment. If additional problems are identified or shortages of resources occur and the estimated completion date is extended, platoon leaders must inform the commander. Promptly making the BAMO/SAMO aware of unforeseen maintenance problems is critical.

TRAINING

Who and what tasks we can train during this job, just by training junior leaders and Soldiers to go through this process, will increase effective maintenance procedures. Using scheduled and unscheduled maintenance to conduct cross training or on-the-job training establishes and maintains essential maintenance skills. Mechanics and crews must train to obtain and sustain the skills they need to maintain aircraft and vehicle readiness.

SUPERVISION

Who is willing to ensure all requirements are met? Who is "standing up at the plate" to answer the commander's questions for follow-up? If the aircraft or vehicle requires evacuation due to enemy activity, would you want the movement delayed because of a lack of repair parts? Prepare for this uncertainty; supervision must occur to prevent excessive downtime or expenditure for returning equipment to the combat or maneuver commander.

Maintenance that may not be performed within the unit's area of operations may require a request for information to be provided across brigade or division boundaries for documentation of clearance requirements. Using an RFI also enables the supervisor to outline planning requirements and present the plan to the chain of command. All unscheduled events that require detailed maintenance should be planned in detail to minimize the downtime of critical assets. ♦

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HAVING TROUBLE REMEMBERING
Those Emergency Procedures

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You're not alone! Have you ever been on a checkride and failed to correctly remember the steps to an emergency procedure you've studied hundreds of times? It happens to a lot of us. The Instructor Pilot Handbook (Aviation Training Brigade) states when a person forgets something, it is not actually lost; rather, it's simply unavailable for recall. According to a recent U.S. Army Aeromedical Research Laboratory survey of 89 students and 105 experienced pilots (19 percent CH-47, 25 percent OH-58, 23 percent UH-60, 23 percent AH-64, and 10 percent other), some pilots are not certain of their ability to recall an EP in the event of an actual aircraft emergency. So, what can be done to help these individuals remember their EPs? Why do some of us forget information we need to know?

The IP Handbook provides three theories that account for forgetting: disuse, interference and repression. Disuse refers to information that is not often used. This may explain the difficulty in remembering some EPs that are the least frequently practiced. Interference describes what may happen when similar information interferes with the memory of information previously learned. New events or experiences can displace previous ones. Many seasoned aviators experience interference when the steps of EPs are changed over time. Repression is said to occur when unpleasant or anxiety-producing material is unintentionally suppressed by an individual. Repression might be uncommon, but it is certainly possible when learning is complicated or difficult, as it may be in flight training.

To aid in the retention of learning, the IP Handbook advises to teach thoroughly and with meaning, adding meaningful repetition aids recall. Aren't we doing these things already? Our platform and flight training provides thorough, meaningful lessons, and there is certainly repetition in our training—especially in EP training. Then why do some of us still have problems recalling EPs we've studied for years? The USAARL survey yielded some interesting findings that may provide some insights useful to Army platform and flight instructors for enriching EP training and boosting recall.

The survey found 43 percent of those questioned stated their first experience at memorizing EPs was not easy for them. Even after their first experience, over a quarter of the pilots (28 percent) reportedly found it difficult to memorize the EPs of any subsequent aircraft. On the other hand, once the procedures were memorized, 59 percent felt they could easily recall them if needed. What is concerning, however, are the 27 percent who aren't

sure if they could easily recall their EPs and the 13 percent who reportedly are sure their recall would not be easy. Notably, UH-60 pilots were more likely to disagree with the statement "recall is easy" than those flying other aircraft types.

The survey also revealed that in order to maintain proficiency in remembering their underlined procedures, most of the group (84 percent) believed EPs needed to be studied or practiced more often than every two weeks. One would think a set of information (the EPs) studied so often would be recalled without difficulty, but apparently it is difficult for some, as 8 percent are not sure and 4 percent lack confidence they can remember their immediate action steps in the event of an actual emergency situation.

The first step in the Army's current practice of teaching aviation EPs is to require student pilots to learn the textual EPs through rote memorization. Too many times instructors tell students what to learn, yet they fail to teach students how to learn. Knowing how to learn involves the learning of strategies, which refer to the many methods in which we take in (encode), store and retrieve (decode) information.

Unfortunately, strategies used for enhancing learning are not an innate student ability. The USAARL survey discovered 76 percent of those questioned were satisfied with their own memorization technique(s), but 8 percent were not. Although a large percentage is reportedly satisfied, the survey also revealed the majority (66 percent) had a genuine interest in learning other memorization methods or techniques to remember their EPs. Instructors can help by providing their students with such additional strategies. They might include techniques in association (associating a new concept/word with one already learned), clustering (grouping related information), imagery (the mind appears to have an unlimited capacity for retaining images) and mnemonic devices.

Mnemonic devices have been used for years to remember aviation-related subject matter such as visual illusions and aircraft system components. Perhaps a concerted effort by the standardization community directed at developing an EP-specific memorization strategy could benefit those who have difficulty with EP recall. Knowing how to remember is as important as knowing what to remember. It's very important to the 12 percent who admit to lacking confidence in their ability to recall EPs. Let's help make certain all pilots can recall their EPs when they need them the most.

For complete information on the survey results, see "A Survey of Aviator Perceptions of Aviation Emergency Procedure Training and Recall," USAARL Technical Report No. 2006-06. It is available at the USAARL Science Information Center or online at http://www.usaarl.army.mil under "Technical Reports." ♦

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TOO MANY TIMES INSTRUCTORS TELL STUDENTS WHAT TO LEARN, YET THEY FAIL TO TEACH STUDENTS HOW TO LEARN.

Litefax What Were They Thinking?

CHRIS FRAZIER
STAFF WRITER/EDITOR

BAMBI TAKES A FALL

We all know the old saying about what happens when you assume; that's right, you make an ASS out of U and ME. Sad to say, but that adage holds true in just about every aspect of life, including Army Aviation. In fact, it happened not too long ago to a UH-60L crew while on a Bambi bucket training mission.

For those who've never seen a Bambi bucket, it's a collapsible nylon container that is suspended below a helicopter. Used as an aerial firefighting tool, the bucket is lowered into a body of water and filled. When the helicopter is over the intended drop site, the water is then released. It may sound simple, but there's plenty that can go wrong—especially if you assume the crewmembers in charge of the bucket know what they are doing.

On this particular training mission, a pilot was to observe the pilot in command demonstrate the operation and then perform the same maneuver himself. The PC filled the bucket, flew it to the intended drop area and lined it up. On the PC's command, the flight engineer then released the water from the bucket.

With the demonstration complete, it was now the PI's turn. The maneuver started without a hitch, with the PI filling the bucket and flying to line it up on the drop zone. When the PC gave the OK to dump the water, the PI released the cargo hook release switch on the cyclic, sending the 660-gallon bucket and sling gear plunging toward the ground. After the drop debacle, the crew returned the aircraft, which was not damaged, to the airfield and performed normal shutdown.

Though it was the PI's actions that sent the bucket falling from the sky, the blame can't be placed solely on his shoulders. While the PC did conduct a thorough crew briefing, investigators determined he failed to properly explain to the PI how the Bambi bucket operation works—such as who does what and when.

The PI apparently confused the portion of the brief that covered who has cargo hook/water release authority (the FE) and who has cargo hook/water release responsibility (the PI). During the aircraft start sequence, the PI tried to clear his confusion by pointing to the cargo hook release switch on the cyclic and asking the PC if it was the button that is pushed to release the load—meaning release the water. The PC told the PI it was indeed the button, *assuming* the PI was referring to the button that releases the bucket, not the water.

Fortunately, this was just a training mission, so there were no firefighters on the ground waiting for assistance with an out-of-control blaze. However, this crew isn't alone when it comes to Bambi bucket mishaps. Here's just a sampling:

- While picking up a water load over a reservoir, the IP asked the crew chief to dump the water to verify the bucket was functioning properly. As the CE released the water, the PI activated the cyclic cargo hook release button, dropping the bucket into the reservoir. The bucket was later recovered.
- While on a water bucket mission, the aircraft approached the fire from a downed slope. The FE, who was observing from the cargo hold, called for the pilot to bring the aircraft up. The pilot increased power to initiate a climb and struck the top of a tree with the bucket, puncturing it.
- While on a firefighting mission, the crew dropped the Bambi bucket after the cargo release button was accidentally pressed. The bucket was engulfed in flames. ♦

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"assume"
... you make an ASS out of U and ME.

Standardization Communication

STACOM Messages 06-07

DOOR GUNNER INTEGRATION AND UTILIZATION

Considering Army Aviation's current warfighting mission, door gunnery has taken on new importance. Understanding how to integrate and utilize door gunners will enhance your unit's combat effectiveness and ensure compliance with Field Manual 3.04-140, *Helicopter Gunnery,* and Army Regulation 600-106, *Flying Status for Nonrated Army Aviation Personnel.*

Door gunner positions are filled by Soldiers who are either MOS qualified (15T, 15U) or not MOS qualified (any other MOS). In either case, all door gunners must be medically qualified and have completed the training required to perform door gunner duties in the aircraft mission, type, design and series. The door gunner is considered a crewmember and will be required to perform some of the same tasks as a crew chief. Performance of these tasks is essential to the safe and effective operation of the aircraft; however, the door gunner is not a CE.

The door gunner will log OR when logging flying time on DA Form 2408-12 (Army Aviator's Flight Record) when performing door gunner duties in accordance with AR 95-1, *Flight Regulations,* paragraph 2-6, a., (2), (a). If the door gunner is MOS qualified, designated on the brief sheet to perform CE duties and fully integrated and readiness level progressed as a CE, he can log CE on DA 2408-12 IAW AR 95-1, paragraph 2-6, a., (2).

All door gunners, regardless of MOS, must be placed on flight orders; satisfactorily pass a Class III flight physical per AR 40-501, *Standards of Medical Fitness;* complete aircrew coordination training; complete night vision goggle training IAW the United States Army Aviation Warfighting Center exportable training package; qualify as a door gunner IAW FM 3.04-140, appendix A; and, at a minimum, complete the training in the following tasks listed in the appropriate aircrew training manual:

Task 1000: Participate in a crew mission briefing.

Task 1014: Operate aviation life support equipment.

Task 1026: Maintain airspace surveillance.

Task 1032: Perform radio communication procedures.

Task 1162: Perform emergency egress (UH-60 only).

Task 1190: Perform/identify hand and arm signals.

Task 1262: Participate in a crew-level after action review.

Task 2112: Operate armament subsystem.

The commander may select additional tasks based on the unit's mission essential task list. If the Soldier chosen for door gunner duties is MOS qualified (15T, 15U), the commander may elect to progress him/her IAW the applicable ATM as a fully integrated CE.

Change 1 to AR 600-106 allows commanders to assign Soldiers to door gunner positions up to 180 days before load availability date for deployment to designated imminent danger/hostile fire areas. Commanders have the option to integrate and train these Soldiers in their door gunner duties and tasks up to 180 days before being deployed. During this time period, the Soldier is authorized hazardous duty incentive pay for flying duty if he meets the minimum flight time of four hours per month as per AR 600-106, paragraph 2-1. Door gunners assigned to units without documented door gunner positions per The Army Authorization Documents System will not exceed one gunner per assigned UH-60 or CH-47 aircraft nor exceed a total of two crewmember positions per assigned UH-60 aircraft or three crewmember positions per assigned CH-47 aircraft.

Currently, there is no written guidance for RL progression of door gunners. A qualified door gunner does not have semi-annual flying hour requirements (except for pay purposes as stated in AR 600-106) or annual proficiency and readiness test requirements. However, the Directorate of Evaluation and Standardization recommends door gunners receive at least one no-notice evaluation during their 12-month deployment to a combat theater in order to check their proficiency. This no-notice may be academic, flight or a combination of both and will include the following academic topics at a minimum:

- Aircrew coordination.
- Fratricide prevention.
- Operation and function of the M240H/M60D.
- Visual search and target detection.
- Duties of the door gunner.
- Techniques of fire and employment.
- Weapons employment during night and night vision device operations.
- Rules of engagement.

All of this training must be documented IAW Training Circular 1-210, *Aircrew Training Program Commander's Guide to Individual, Crew, and Collective Training.* Units will use DA Form 3513 individual aircrew training folder with DA Form 7120-R (Commander's Task List) DA Form 7120-1 (Crewmember Task Performance and Evaluation Requirements), DA Form 7120-3 (Crewmember Task Performance and Evaluation Requirements Remarks and Certification) and DA Form 7122 (Crewmember Training Record) to record and document training, qualification, evaluation and commander's authorization. These requirements will be integrated into TC 1-237, *Aircrew Training Manual, Utility Helicopter, H-60 Series;* and TC 1-240, *Aircrew Training Manual, Cargo Helicopter, CH-47D,* in a future change.

Understanding how to integrate, train, qualify and document Soldiers assigned to your unit as door gunners will not only enhance your unit's door gunner training program, it will also provide better-quality door gunners to units deployed in combat theaters. ♦

Standardization communications are prepared by the Directorate of Evaluation and Standardization, U.S. Army Aviation Warfighting Center, Fort Rucker, Ala. 36362-5208, DSN 558-2603/2442. Information published in STACOMs may precede formal staffing and distribution of Department of the Army official policy. Information is provided to commanders to enhance aviation operations and training s upport.

Scott B. Thompson

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COL, AV
DIRECTOR OF EVALUATION
AND STANDARDIZATION

Accident Briefs

Information based on preliminary reports of aircraft accidents

Class A

OH-58

A Model

• Class A: The pilot experienced a loss of power and the aircraft descended to ground impact. The aircraft skidded and then overturned onto its side.

UH-60

A Model

• Class A: Two crewmembers suffered fatal injuries when the aircraft impacted water during an night vision goggle flight and came to a rest inverted.

AH-64

A Model

• **Class E:** The intermediate gearbox temperature light illuminated during a five-foot hover power check and remained on until shutdown. The mission was canceled and the aircraft returned to the ramp.

• **Class E:** The BUCS FAIL caution/warning light illuminated while the aircraft was on short final for landing. The crew continued the approach and landed without further incident. The crew performed a normal engine shutdown and secured the aircraft. Maintenance discovered the lateral servo was not functioning properly and replaced it, along with the pilot's station lateral linear variable differential transducer.

• **Class E:** An odor was noticed in both cockpits, and the crew chief observed white smoke coming from the catwalk area. An emergency engine shutdown was performed.

D Model

• **Class E:** During aircraft runup, the copilot/gunner's helmet display unit failed to stay focused. The HDU still would not focus after adjustment of the display adjustment panel, so the DAP was replaced.

• **Class E:** The AN/ALQ-144 system failed during flight. Armament personnel replaced the system and, following a maintenance operational check, the aircraft was released for flight.

• **Class E:** The target acquisition designation system froze in azimuth and elevation during flight. The optical relay tube failed and was replaced. After an MOC, the aircraft was released for flight.

• **Class E:** During runup, the copilot's HDU worked for five minutes before going blank. The DAP was replaced.

CH-47

D Model

• **Class E:** The No. 1 engine chip detector latch would not reset. The chip detector was checked and no metallic particles were found. The crew stopped the runup procedures and requested assistance. The wire on the latch was repaired, and the aircraft was returned to service.

• **Class E:** During flight, the flight engineer heard a strange noise coming from the forward transmission area and the pilot noticed the forward transmission oil pressure was reading 102 psi. The crew decided to return to the airfield and shut down. The aircraft's forward transmission main oil pump was replaced, and the aircraft was returned to service.

• **Class E:** During a simulated engine failure approach to a roll-on landing with the No. 1 engine at ground, the No. 2 engine torque fluctuated and the FADEC 2 light illuminated. Engine No. 1 was brought to flight, and the aircraft landed with the No. 2 engine in reversionary. Maintenance replaced the No. 2 engine hydraulic mechanical unit, and a limited test flight was conducted. The aircraft was released for flight.

EH-60

A Model

• **Class E:** While in flight, the No. 1 generator caution light illuminated and would not reset. The aircraft landed without further incident. Maintenance replaced the engine cable assembly.

• **Class E:** The aircraft failed the health indicator test check. The No. 2 engine was 2 C above the positive limit. The aircraft landed without further incident, and maintenance replaced the No. 2 engine.

MH-47

E Model

• **Class D:** While operating under instrument flight rules flight in instrument meteorological conditions, the aircraft was descending through the clouds when the temperature change caused the pilot's windscreen to crack. The windscreen heat was on.

• **Class E:** During external load training, the No. 1 flight hydraulic pressure dropped to zero on the maintenance panel with corresponding lights in the cockpit. The instructor pilot turned on the No. 1 power transfer unit and pressure returned. The crew executed a precautionary landing with a slingload without further incident. The aircraft was shut down and maintenance was contacted.

G Model

• **Class D:** The crew conducted a NVG landing to an airfield helipad and was ground taxiing to parking when the right-rear landing gear tire rim failed and punctured the tire. The aircraft was shut down in place, and the rim assembly was replaced. The aircraft was returned to service.

OH-58

D(I) Model

• **Class D:** While the aircraft was sitting on the ground at 100 percent RPM, the crew heard a loud cracking noise and the aircraft immediately settled to the right. The cyclic and collective were adjusted to compensate for the right "dip" of the aircraft and to relieve the pressure on the skids. Maintenance inspection revealed the front-right portion of the skid was broken at the cross tube at the mounting point.

• **Class E:** The DC generator failed during runup. Three attempts were made to reset the generator, but all were unsuccessful. Maintenance determined an electrical shunt was faulty and it was replaced.

TH-67

A Model

• **Class E:** Just before entry to an autorotation with a 180-degree turn, the pilot's door opened and the sliding window cracked. Maintenance replaced the window.

UH-60

A Model

• **Class E:** While in formation flight on an NVG troop extraction mission, the crew felt abnormal vibrations coming from the rotor system. The aircraft was flown to the airfield, where a normal approach and landing was made with no further vibrations felt. Postflight inspection revealed blood and feathers on the black main rotor blade. There were no indications of damage.

L Model

• **Class C:** The tail rotor deice cable apparently separated in flight and contacted the tail rotor system, damaging one paddle and both tip caps.

• **Class E:** During postflight shutdown, the crew noticed the anti-collision light appeared brighter than normal. The lower one-third of the lens (red part) had been shattered during flight/dust landings. Further inspection of the aircraft revealed no additional damage. It is believed the light was struck by a rock or some other foreign object debris. Maintenance replaced the light, and the aircraft was returned to service.

• **Class E:** During initial runup, the crew chief noticed fluid leaking from the bottom of the tail pylon. After shutdown, the crew chief removed the tail cone access covers and discovered the tail pylon quick disconnects were leaking. The quick disconnects were replaced, and the aircraft was returned to service.

C-12

R Model

• **Class E:** During climbout, the aircraft encountered light icing conditions. The crew initiated propeller deice procedures and noted a failure. The crew exited the icing conditions, returned to home base and terminated the mission. Maintenance was notified and later determined the propeller brush block assembly was faulty.

ARMY AIRCRAFT LOSSES FY02 TO PRESENT*

	HOSTILE/NON-HOSTILE	COST
AH-64A/D	8/44	$1.09B
U/MH-60L	6/22	$191.8M
C/MH-47	6/13	$718.9M
OH-58D	8/21	$181.2M
Total	28/100	$2.18B

*As of September 19, 2006

UNMANNED AIRCRAFT SYSTEM

CQ-10A

• Class B: The Unmanned Aircraft System crashed after entering an uncommanded descent. A total loss was reported.

RQ-7B

• Class B: The UAS operator experienced a generator failure during climbout to altitude. The UAS impacted the ground, but the recovery chute was deployed and the aircraft was recovered. The vehicle and payload were a total loss.

• Class B: The UAS operator experienced an AP SERVO FAILURE indication during climbout and subsequent loss of control of the aircraft. The recovery chute was deployed and the UAS was recovered. The vehicle and payload were a total loss.

RQ-11

• Class B: The UAS operator lost downlink to the ground control unit shortly after takeoff following battery replacement. Efforts to locate the UAS were unsuccessful and a total loss was reported.

• Class C: Link with the UAS was lost after it drifted off course during high winds. Efforts to locate the UAS were unsuccessful and a total loss was reported.

• Class C: The UAS operator lost visual link with the aircraft during flight. Efforts to locate the UAS were unsuccessful and a total loss was reported.

• Class C: The UAS entered uncommanded AUTOLAND mode and landed. Efforts to abort were unsuccessful. Aircraft recovery was not reported.

• Class C: The UAS operator lost control link, and the aircraft initiated a climb. A total loss was reported.

• Class C: The UAS operator lost GCU downlink with the aircraft shortly after takeoff. Aircraft recovery was not reported.

Editor's note: Information published in this section is based on preliminary mishap reports submitted by units and is subject to change. For more information on selected accident briefs, contact the U.S. Army Combat Readiness Center Help Desk at DSN 558-1390 (334-255-1390) or by e-mail at helpdesk@crc.army.mil.


TAKE CONTROL
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